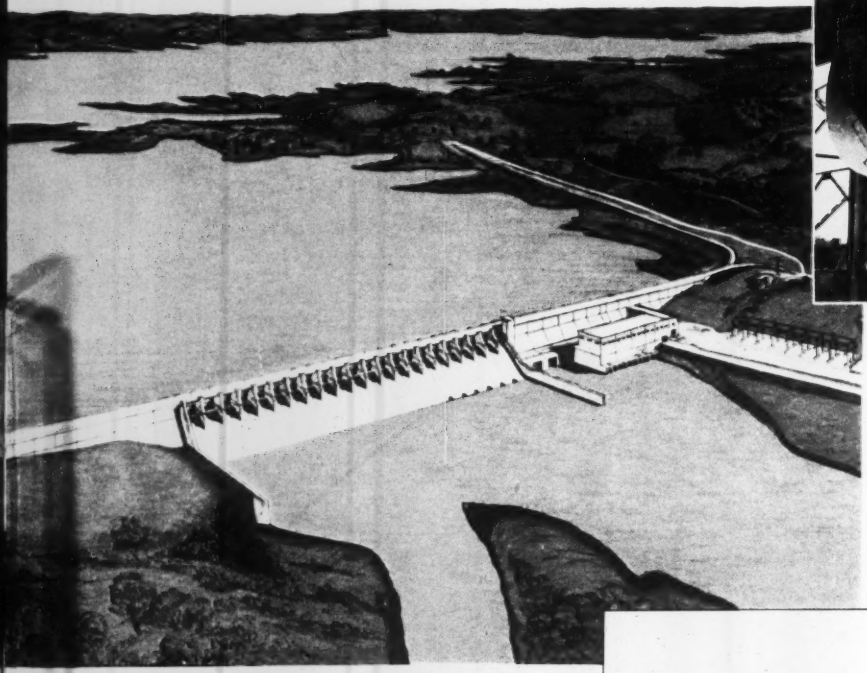
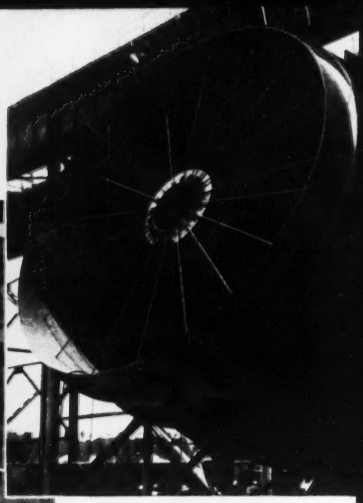
ENGINEERING NEWS-RECORD

A McGRAW-HILL PUBLICATION

9 welded steel penstocks for Buggs Island Dam





Above: This view shows a few rings of one of the penstocks we erected at the Buggs Island Dam. The internal "spiders" in the penstocks are removed after the concrete is poured around them.

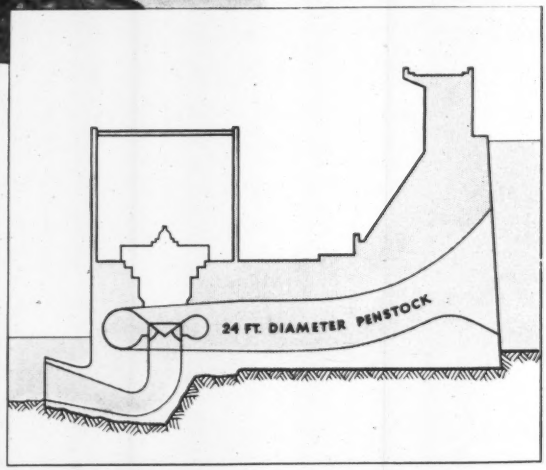
Left: Artist's drawing showing the Buggs Island Dam, impounded reservoir and powerhouse. The project is under the direction of the Department of the Army, Corps of Engineers, Norfolk District.

The Buggs Island Dam, across the Roanoke River near South Hill, Va., is being constructed for flood control, generation of hydroelectric power and other allied uses. We recently installed all nine of the welded steel penstocks that will let water flow from the reservoir to the powerhouse (powerhouse is structure in front of dam at right).

Six of these penstocks are 24 ft. in diam., one is 15 ft. 6 in. in diam. and two are 5 ft. 6 in. in diam. The upper ends of three of the 24-ft. penstocks are bulkheaded for the present.

The penstocks are made of steel plates varying from $^3/_8$ to $^7/_8$ in. in thickness. We fabricated the plates at our Birmingham plant and assembled them into sections at the dam site. Manufacture of the penstocks required about 1,430,000 pounds of steel.

Penstocks are typical examples of the heavy steel plate structures we fabricate and erect for construction projects. Our other products include plain and differential surge tanks, smokestacks, large-diameter pipe, flat-bottom reservoirs and elevated water tanks. Write our nearest office for quotations when you need steel plate structures of any type.



Above: Diagrammatic cross section of the Buggs Island Dam intakes, penstocks, and powerhouse. Initially, three 45,000 hp, one 17,000 hp and two 1,600 hp turbines will be installed in the powerhouse. Net head on each of the turbines will be 90 ft.

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DEPENDABILITY

3 machines used on six big jobs in three years . . . with only ONE MAJOR OVERHAUL!

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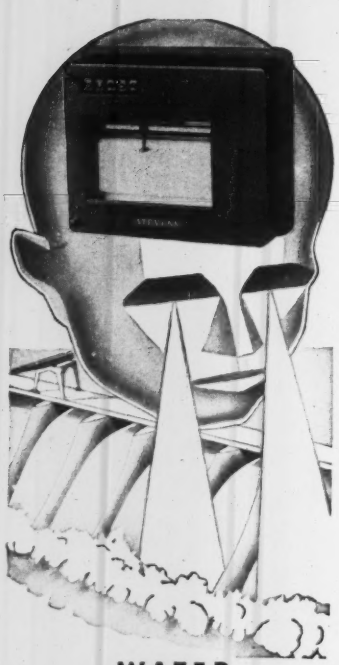

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ENGINEERING NEWS-RECORD

ABP Member ABC

Volume 146 — MARCH 8, 1951 — No. 10

WALDO G. BOWMAN
Editor

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For a description of these steel poles, write for Bulletin No. 14. National Tube Company, Frick Building, Pittsburgh 19, Pa.

NATIONAL TUBE COMPANY, PITTSBURGH, PA.

COLUMBIA STEEL COMPANY, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS • UNITED STATES STEEL EXPORT COMPANY, NEW YORK

NATIONAL *Tubular* STEEL POLES

UNITED STATES STEEL

FOR THE BEST IN MOBILE CRANES YOU NEED A CRANEMOBILE

This BAY CITY Model 190-T61 CraneMobile, owned by Sere Erection Co., is setting an 18-ton steel truss in the framework of a new Memphis church auditorium. For other steel work, longer boom and jib was used but caused no delay as boom sections are pin-connected and furnished with socketed pendant cables.

Handle 25 ton loads gently and accurately

The big capacity of the "190" CraneMobile puts you out front on heavy lifts or long boom work. With both crane and carrier built by BAY CITY you'll have a nicely balanced crane with a low center of gravity for dependable, on-the-job performance. From every angle, the solid ruggedness is apparent. Look at the specially designed carrier with long wheel base for better roadability. It is amply powered and sturdily built to match the heavy-duty construction of the crane machinery. There are many reasons contractors prefer the BAY CITY built CraneMobile . . . let us show you why. Write for latest catalog or see your nearest dealer.

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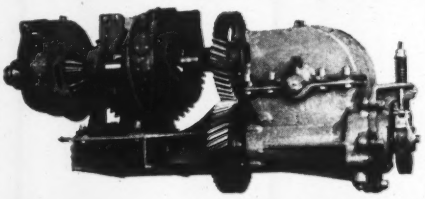
BAY CITY, MICHIGAN

183

CHECK LIST

- 20-25 Ton Capacity
- Pin-Connected Boom
- Hi-Collapsible Gantry
- Independent Power Boom Hoist
- Precision Power Load Lowering
- Removable Counterweight
- Specially Designed Carrier
- High Road Speeds

This heavy duty independent boom hoist is of the self locking worm and worm wheel type operated by separate friction clutches to boom-up and boom-down only under power. Will readily handle boom and load. All controls conveniently located.



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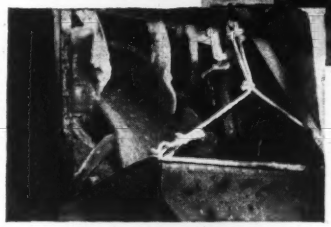
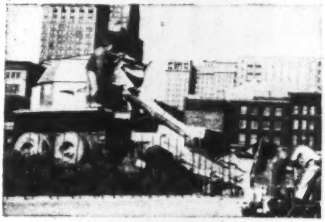
17 Years Young and 3,100,000 Cubic Yards to show for it!

126-S Worthington-Ransome Big Mixer at Arundel-Brooks Concrete Corporation's Wolf Street plant, Baltimore, shows hardly any sign of wear after having poured 3,100,000 cu yd in its 17 years.



Worthington-Ransome 126-S discharging full 5 cu yd batch in approximately 30 seconds.



One of Arundel-Brooks' 6½ cu yd agitators pouring a retaining wall at General Sam Smith Park, being built to relieve traffic congestion at Light and Pratt Streets, Baltimore.

In 1950—its 17th year—this veteran concrete mixer poured more than 250,000 cu yds on a single set of liners!

This extraordinary performance of a 126-S Worthington-Ransome Blue Brute concrete mixer is attested to by Arundel-Brooks' records. The machine, given proper maintenance over its lifetime, shows virtually no wear after uncounted hours of profitable service.

Arundel-Brooks operates two other Worthington-Ransome Big Mixers—an 84-S at the Sparrow's Point plant, a 56-S at Brooklyn, Md.

And eight of the company's growing fleet of truck-mounted agitators are Worthington-Ransome Blue Brute Hi-Ups, considered "highly satisfactory in every respect."

These eight are used for most long-distance hauls because their light weight* permits carrying a maximum payload with strict adherence to highway load limits.

FIND OUT WHY THERE'S MORE WORTH IN WORTHINGTON

See your nearby Worthington-Ransome distributor. Worthington Pump and Machinery Corporation, Construction Equipment Sales Division, Dunellen, N. J.

*7,290 lb for the standard 4½ cu yd truck mixer, as little as 6,700 lb for 6½ cu yd agitator models.

WORTHINGTON

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You'll find you, too, can get the real *performance plus* from Worthington and Worthington-Ransome Blue Brutes—a broad line of construction equipment noted for the rugged quality your type of work demands.

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IF IT'S A CONSTRUCTION JOB, IT'S A BLUE BRUTE JOB

"Cat" Bulldozer

AMERICA'S ALL-PURPOSE TOOL

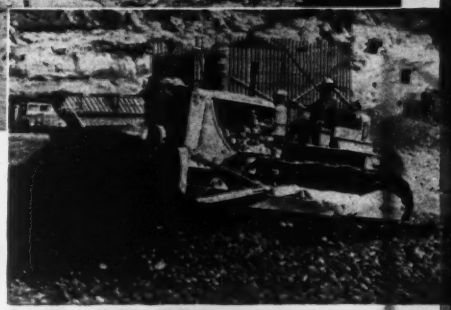
W. C. GREEN counts on his versatile "Caterpillar" D7 Tractor with matching 'dozer to pinch-hit on a dozen assignments when the going gets rugged at the Toketee Falls project in Oregon. "This is a straight 'Cat' outfit," he says. "Wouldn't have anything else. I like the dependability and performance—it's built to take it and to give a good day's work every day!"

These machines give you matched design—tractor and 'dozer built to work together. This rugged team is a bear at meeting work schedules. Sturdy construction and quality materials enable it to keep punching full time without down-time, and the special steel cutting edge of the blade hammers through the toughest going. Most important of all, the precision methods used in "Caterpillar" factories build extra years of life into these tools.

For help with your equipment problems, see your "Caterpillar" dealer *now*. Today's expanding military program has high priority. But it is recognized that our national preparedness depends upon stepped-up civilian production too. We must have more lumber, coal, food and essential ores. We must continue to build and improve America's vital network of highways. So your "Caterpillar" dealer is especially interested in meeting your needs—through equipment replacement and by exercising his working partnership with you to keep the machinery you have *on the job*.

CATERPILLAR, PEORIA, ILLINOIS

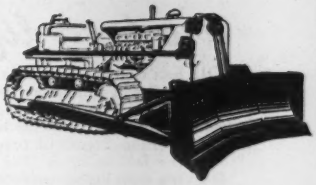
This No. 7A "Cat" 'Dozer is ruggedly built to bull through heavy boulders, doing clearance on the Toketee Falls project, Oregon. It also does tamping, ripping, and pioneered 5 miles of road for a power line on this essential job.



The same "Caterpillar" Bulldozer is so easily controlled it handles finishing jobs on the downstream side of the dam. After tamping clay core, it is now spreading gravel and sand to tie the clay in on the downstream side of the Toketee project. This tool is tough and maneuverable—stands up under the pounding of a 16-hr. day. Price of a standard "Caterpillar" D7 Tractor is $11,010; No. 7A Bulldozer, $1,975; No. 24 Cable Control, $730, f.o.b. Peoria. Prices subject to change without notice.

"CATERPILLAR" BULLDOZER EXTRA FEATURES

1. Tractor and 'dozer *broken to harness,* and a size for every need.
2. Moldboard curvature for active, *rolling,* higher production loads.
3. Box section side arms — extra thick at points of greatest stress.
4. Choice of straight or angling type of blade, simple to maneuver and easy to adjust or detach.
5. Your choice of hydraulic or cable controls.
6. The power of the "Caterpillar" Diesel Engine is geared to blade *capacity.*



NEW ADDITION TO 'DOZER LINE

Here's a specialist that can step up production and cut costs. It's the brand new No. 8U 'Dozer for use with the "Caterpillar" D8 Tractor, with cable control. Working best in loose or light material, the end portions of the blade extend forward to form the U, enabling it to drift large loads for longer distance without spillage. The No. 8U is built to the same high standards of strength and long life as the other "Caterpillar" Bulldozers. The versatility of this new tool gives it excellent performance on all kinds of 'dozing jobs, from stockpiling to pioneering.

CATERPILLAR

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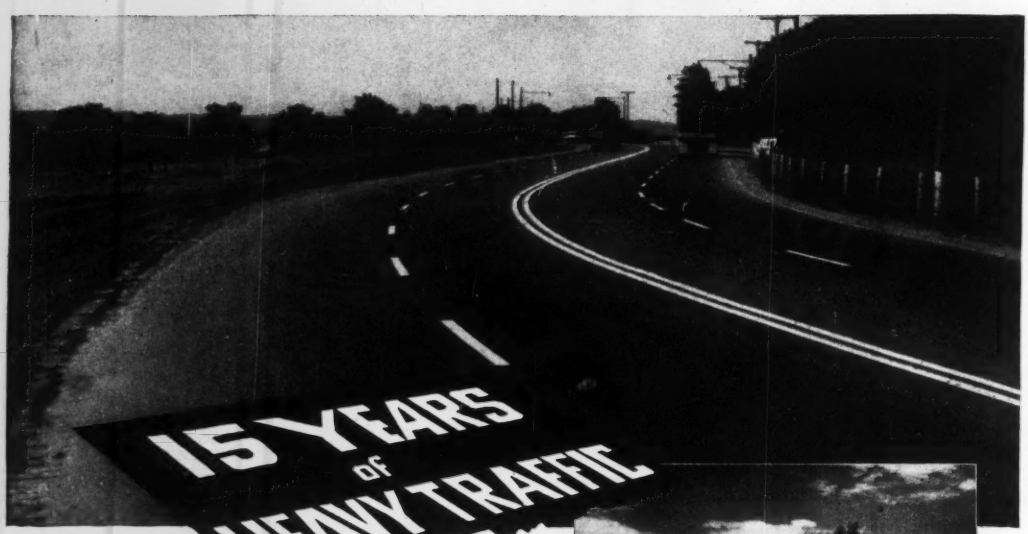

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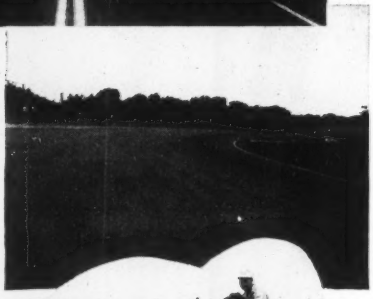
THE best testimonial to Adnun design is the excellent condition of the miles of Adnun laid roads that have carried 15 to 16 years of heavy traffic. The oldest machine laid roads in the world are Adnun Roads. Look at the heavily traveled highway above—a part of the Hamilton-Brantford road in Ontario, one of Canada's main arteries—laid in 1936. The one below—Colorado Blvd.—one of Denver's well known streets laid in 1935. And the bottom picture—part of the Indianapolis Speedway laid in 1936.



These are but a few of many photographs in our files that show prominent traffic arteries in city, state and county systems. These are roadways that bear heavy traffic counts: Streets that take the beating of trucking and speed under a full range of weather conditions. Note the eveness of wear *clear across,* the few signs of patching, the freedom from breakdown.

The Adnun principle of continuous Course Correction assures surface smoothness and a uniformity of course thickness that no other paver can equal. The Oscillating Cutter Bar action cuts the material off at the proper level and does not tear it. Material is carried up to the parallel course and is compacted in place, making a tight joint, a joint that will not throw a car off its course. *The Adnun builds longer life roads and safer roads.*

You will be interested in the booklet, "11 Basic Things." It will give you some new thinking on black top paving equipment. Send for it.

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NEWS BRIEFS

Overseas jobs open—Portland, Ore., District, Corps of Engineers, has been directed to recruit civilian employees for work with the Corps of Engineers in important overseas areas, Col. Donald S. Burns, Portland District Engineer, has announced. Vacancies exist in Okinawa, Japan, Guam, Austria, Germany, France, Trieste and Turkey. The positions are for engineers, engineering aides, draftsmen, inspectors, construction superintendents, equipment and diesel power mechanics, property and supply, repair and utility foremen. In the age group from 18 through 26 only veterans will be considered for overseas appointment and they will be required to obtain a release from their draft board. Interested qualified persons should apply to the District Engineer, Portland District, Corps of Engineers, 628 Pittock Block, Portland 5, Ore.

Firetrap?—The Massachusetts State House at Boston was described as "one of the worst firetraps in Boston" at a recent hearing on construction of an underground vault for the storing of valuable state documents. Representative Howard S. Russell, who made the charge, warned that in the event of fire or "some other catastrope" the state government could be "thrown into chaos" because of destruction of priceless records. He estimated that a fireproof, bombproof vault could be built under Beacon Hill at a cost of $125,000, and that it might also serve as a bomb shelter.

Unique highway—Bisbee, Ariz., will lay claim to one of the world's unique highways when plans to re-route U. S. 80 are fulfilled to make way for a new open-pit copper mine. H. M. Lavender, vice-president and general manager of Phelps Dodge Corp's western division, said the company plans to place the highway on one of the benches in the pit, which will be the deepest in the world. The ore body is 350 ft underground. Corporation officials estimate $25,000,000 will be required to get the mine into production. The new highway will be several hundred feet longer than the present route, will replace an elaborate cloverleaf at the Lowell-Warren intersection, but will be over a better grade alignment. It will be of standard U. S. construction.

Controlling air pollution—In recent months, sixty Baltimore industrial firms have installed about $5,000,000

(*Continued on page 12*)

YOURS FOR EARLY FULFILMENT ... CONTINENTAL

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RED SEAL POWER

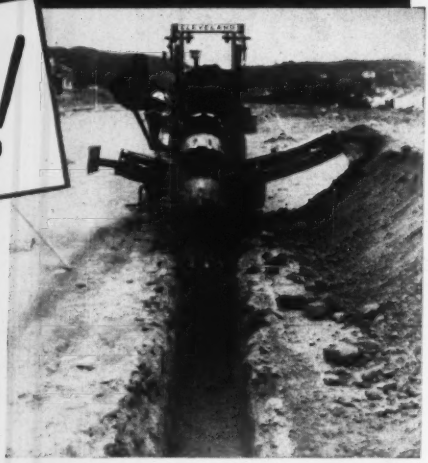
There are enough uncertainties in the way of on-time completion without any needless gambling on factors you can control. You can't have your weather made to order, nor insure your materials deliveries—but you CAN minimize the grief from these and other causes, by making doubly sure your mechanical equipment is right. You'll find Continental Red Seal engines powering leading makes of construction equipment—mixers, shovels, rollers, compressors, pumps, generating sets, winches, hoists, trucks and tractors for highway and off-highway use, and many other specialized machines. And the unusually wide interchangeability of parts from model to model makes it especially wise, in times like the present, to standardize on equipment with Continental Red Seal power.

FACTORY-AUTHORIZED SERVICE AND GENUINE CONTINENTAL RED SEAL PARTS AVAILABLE FROM COAST TO COAST

Continental Motors Corporation
MUSKEGON, MICHIGAN

CLEVELANDS

have it!



THE BASIC ENGINEERING DESIGN THAT MAKES THE DIFFERENCE—

Makes the difference in capacity, in maneuverability and in ruggedness that keeps CLEVELANDS on or ahead of schedule in the most cramped locations no matter what the soil or terrain. Makes the difference in maintenance and operating costs that means new efficiency and economy in every kind of trench excavation. CLEVELANDS elimination of all excess weight saves on power and helps give the high flotation that takes sticky mud or soft fill in stride. CLEVELANDS principle of weight distribution keeps the right weight on the digging wheel, keeps the whole machine in perfect sure-footed balance on the steepest grades. CLEVELANDS advanced structural design and special-strength alloy steels keep CLEVELANDS compact and maneuverable, keep them out of the repair shop. To all this add CLEVELANDS higher cutting capacity and you have "the difference." See your local distributor or write direct for details.

THE CLEVELAND TRENCHER CO.

20100 ST. CLAIR AVENUE • CLEVELAND 17, OHIO

worth of equipment to control air pollution, an Association of Commerce committee announced recently. The figures were compiled from a preliminary report on the questionnaire-survey being made by the association's committee on air pollution, under the chairmanship of W. Frank Roberts. The trend toward eliminating preventable pollution arising from fuel combustion or manufacturing processes is continuing, Mr. Roberts added.

Chuckhole committee—The police department of Indianapolis has enlisted the aid of citizens in keeping tabs on the need for street repairs. The traffic officers claim that there are too many "chuckholes" at present for the safety and comfort of autoists.

Oil and water don't mix—Investigation of oily pollution in the Delaware River and its sources between Philadelphia, Pa., and Wilmington, Del., is now being made by field men of the U. S. Army district engineer's office at Philadelphia. The work includes taking samples every 24 hours at sewer outlets along the waterfront. In addition, hourly samples will be taken of the effluents from 42 industrial plants. A report will make recommendations.

Can't sell culm—There have been no takers in Pennsylvania's efforts to sell some 3,500,000 cu yd of culm dredged out of the Schuylkill River. (ENR March 10, 1949, page 21) although the Department of Forests and Waters claims that about 50 percent of the material is recoverable as industrial fuel. Says E. S. McCawley, deputy secretary of the department, "We can't understand why no bids were submitted". Does anybody know the answer?

For ambulance service—City council of Anderson, Ind., has instructed the Board of Public Safety to pay for emergency ambulance service in that city with funds derived from parking meters. Poetic justice about that, perhaps, as automobiles cause most of the accidents.

A "road of tomorrow"—Recently Governor Lane of Maryland dedicated the first section of the Baltimore-Washington Expressway—a 6-mile strip which extends from the Baltimore city line to Friendship International Airport. "This highway", the governor declared, "was designed for the future. It is a true road of tomorrow in conception and construction". Eventually it will link with an 18-mile superhighway the federal government is building to Washington.

(*Continued on page 14*)

Up-in-the-air job . . .

Bridge over the Mississippi River, Hastings, Minnesota, 2600 tons fabricated and erected.

built by down-to-earth methods

saves you money, saves you time!

3 HUGE FABRICATING PLANTS OPERATE AS A UNIT

- Clinton Bridge Corporation
- Gage Structural Steel Corporation
- Midland Structural Steel Corporation

The bridge you see here in the course of construction is over the mighty Mississippi River at Hastings, Minnesota.

Have you noticed what's different about the erecting technique? Sure you have . . . it's the speedy water-level method of raising and joining the members, instead of the usual slow inching of erecting derricks over newly laid sections at the bridge floor level.

Exclusive construction innovations, with modern fabricating short cuts which can be carried on simultaneously in 3 plants operating as a huge manufacturing unit, combine to save you time and money.

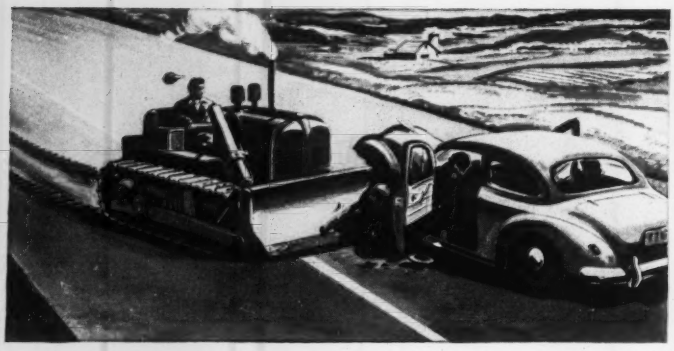
Our engineering-estimating department would like to quote on your jobs wherever fabricated structural steel is specified. Send your plans and specifications to us.

ALLIED STRUCTURAL STEEL COMPANIES

Engineers • Fabricators • Erectors

20 N. WACKER DRIVE CHICAGO 6 ILLINOIS

Fabricators and erectors of structural steel for highway and railroad bridges; Industrial, office, school, and government buildings; Airport structures; Harbor facilities.



Our grader got us into an awful scrape!

(Based on Hartford Claim #46 KL 70193)

We were on a bridge-construction job when it happened. Our bulldozer-grader was moving along the highway when a hydraulic piston head in the steering gear broke. Swerving crazily, the heavy machine crashed into a passing sedan. The car was badly damaged and the driver and his wife severely hurt. Car repairs cost over $300 and the occupants sued us for $35,000 for their injuries.

Fortunately we have Contractors' Liability Insurance in the Hartford. The insurance company handled the claims and made a satisfactory settlement... without trouble or expense to us. Mighty good thing, too! We wouldn't have made a dime on the job if we'd had to pay the loss ourselves.

• • •

In the contracting business, proper Liability insurance is a MUST. Without this protection, you can't be sure of a profit on *any* job... and you're wide open for a staggering loss! With its experience and facilities as one of the largest and strongest insurance carriers in the field, the Hartford is particularly well equipped to handle your needs for Liability insurance. Contact your local Hartford agent or your own insurance broker for the facts on Hartford advantages. In more than 5,000 communities the name of the Hartford agent can be secured by calling Western Union by number and asking for "Operator 25."

HARTFORD

HARTFORD FIRE INSURANCE COMPANY
HARTFORD ACCIDENT AND INDEMNITY COMPANY
HARTFORD LIVE STOCK INSURANCE COMPANY
Hartford 15, Connecticut

Year in and year out you'll do well with the Hartford

Free public library—A new public library on Yonge Street, Toronto, Ont., is unique since it is in a municipally-owned building which will not cost taxpayers anything. This Deer Park branch will be located in a 3-story structure being erected at a cost of $473,000. On the street-level floor will be the adult library, and three retail stores. The second floor will house the boys' and girls' library, and professional offices, while the third floor will be all rented out for professional offices. Thus the Toronto Library Board will have a self-supporting building the cost of which will be entirely amortized in 20 years or less.

Sign of the times—In Colorado Springs, Colo., a new firm has hung out its sign, reading "U. S. Bomb Shelter Construction Corporation."

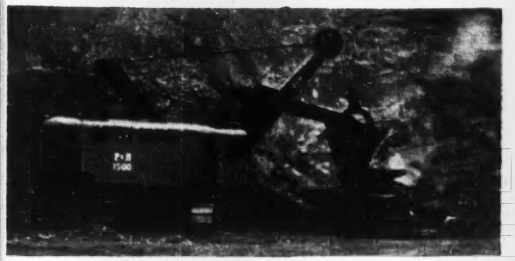
Tough old contractor—Robert A. Early a retired contractor of Corbin, Ky., is 101 years old. Asked for the secret of his longevity, he said "I go to bed at 6 p.m. and rise at 6 a.m. As for tobacco, he says, "I smoke my pipe once a day—from the time I get up till I go to bed."

Awards to architects—The American Institute of Architects, desiring to encourage the appreciation of excellence in architecture and to recognize exceptional merit in recently completed buildings, is continuing its annual nationwide program of honor awards, which will be made for distinguished accomplishment in residential, industrial and hospital buildings completed since Jan. 1, 1946. Particulars may be obtained from Albert F. Heino, Chairman, Committee on Honor Awards for Current Work, A.I.A., The Octagon, 1741 N. Y. Ave., N. W., Washington 6, D. C.

The cover

Dr. Edward U. Condon, director, and Douglas Parson, chief of the Building Technology Division, respectively, of the National Bureau of Standards, are not standing on a slanting floor, nor is the test of a concrete beam being conducted on the bias, as would appear from the cover picture.

The slight slant is the result of a cameraman's enthusiasm for framing and "angles." When ENR decided to mark the Bureau's fiftieth anniversary (see page 32) with a story and a cover, Bureau cameramen were called in. The best of their pictures was this one. Unfortunately, it was so well framed that a rectification of its lines would have partially decapitated Mr. Parsons.



triple play for profit

with P&H ELECTRIC SHOVELS

All three of these P&H Electric Shovels are at work for J. Robert Bazely at Pottsville, Pa. There are three sizes at work here — 4, 5 and 6 cu. yds., all delivering steadily at rock bottom costs..

P&H leads the field in Electric Shovel Developments.

It's the same pattern wherever these new P&H Electric Shovels go to work: The first machine sells the second — the third — and more.

The reasons are plain and simple — *better performance — bigger production — lower tonnage cost.*

Reasons behind the reasons are such advantages as P&H Magnetorque* which powers hoisting motions electro-magnetically — smoother, faster, more dependably . . . rugged all-welded construction with more strength to withstand shock loads . . . independent propel for quicker move-ups . . . stepless control which eliminates all contactor troubles . . . filtered air cab ventilation for less electrical down time.

The cold, hard facts that count are: *performance, production, low tonnage cost.* Figure your costs with P&H Electric Shovels and you'll find a convincing difference. It explains why every third P&H Electric Shovel sold is a repeat order.

*T. M. of Harnischfeger Corporation for electro-magnetic type clutch.

P&H ELECTRIC SHOVELS
4404 West National Avenue
Milwaukee 14, Wisconsin
HARNISCHFEGER CORPORATION

Every third P&H Electric Shovel sold is a repeat order

EXCAVATORS • OVERHEAD CRANES • HOISTS • ARC WELDERS AND ELECTRODES • SOIL STABILIZERS • CRAWLER AND TRUCK CRANES • DIESEL ENGINES • PRE-ASSEMBLED HOMES

"Low level bidding" gets the job— maintains profit

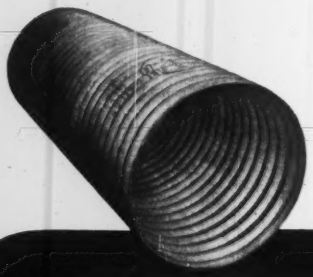
Successful drainage bids are ones that get the job and *retain adequate profit.* That's why so many experienced contractors are practicing "low level bidding" with Armco Corrugated Metal Pipe. They have found the cost of installing short, sectional pipe requires higher bids to maintain profits.

Figured on an *installed* basis Armco Pipe saves money in many ways. Flexible, corrugated metal design assures ample strength without excess weight. This means low handling and hauling costs. Job costs are low because unskilled labor quickly and easily makes the installation. There is no breakage, no curing, no waste, no delay.

Individual sections of standard Armco Corrugated Pipe and PIPE-ARCH are supplied in any length that can be hauled and handled. No large and expensive equipment is required for installation. A few men with a rope sling or a small A-frame can handle the largest structure. Connections are made with simple band couplers. Where end finishing is needed, prefabricated Armco End Sections are simple to install.

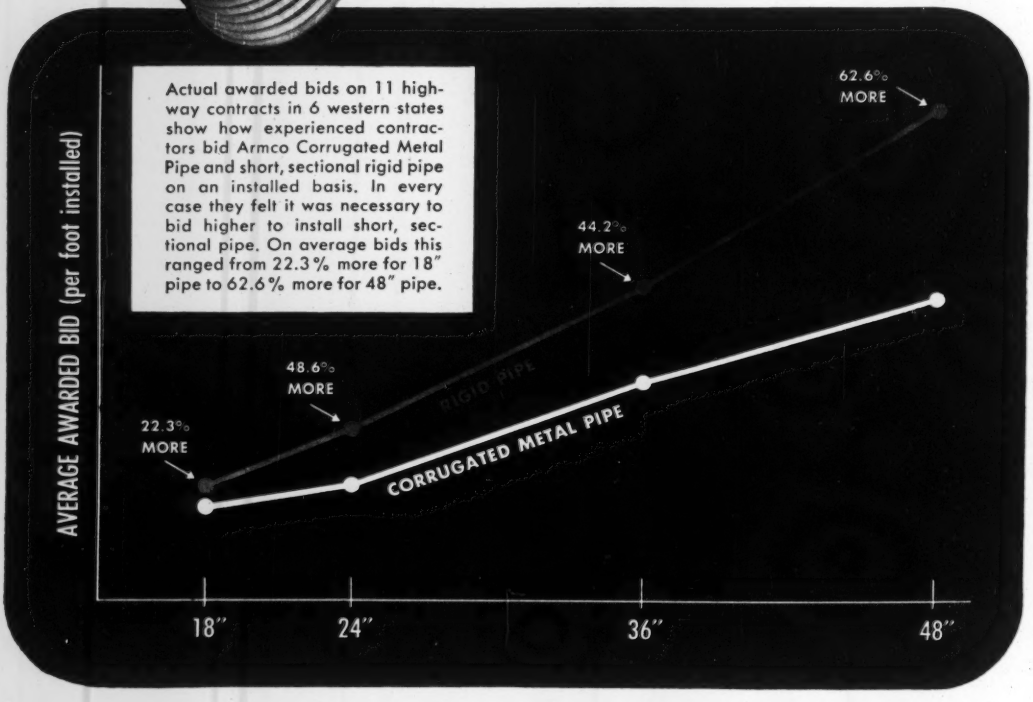
Use Armco Drainage Products on highways, railways, airports and wherever else you need economical, easy-to-install drainage structures. Armco Drainage & Metal Products, Inc., 1571 Curtis Street, Middletown, Ohio.

Export: The Armco International Corporation



ARMCO ***CORRUGATED METAL PIPE***

ARMCO


Actual awarded bids on 11 highway contracts in 6 western states show how experienced contractors bid Armco Corrugated Metal Pipe and short, sectional rigid pipe on an installed basis. In every case they felt it was necessary to bid higher to install short, sectional pipe. On average bids this ranged from 22.3% more for 18" pipe to 62.6% more for 48" pipe.
AVERAGE AWARDED BID (per foot installed)
62.6% MORE
44.2% MORE
48.6% MORE
22.3% MORE
RIGID PIPE
CORRUGATED METAL PIPE
18"
24"
36"
48"

THE CONSTRUCTION WEEK

NPA NAILS DOWN EQUIPMENT—Construction machinery makers just got the word from NPA: accept DO orders up to 50% of average monthly output (first six months of '50). The order actually sets the stage for more control. If mining, logging, and defense building are short, help may come soon.

NO FAVORITES, PLEASE!—A union's request for the illegal discharge of an employee constitutes a violation of the Taft-Hartley Act, the National Labor Relations Board has ruled. The board made the decision after AFL Operating Engineers' Union, Local No. 101, Kansas City, had requested the discharge of two members of a subordinate local—No. 101-B. Sub Grade Engineering Co., Omaha, agreed to the request and laid off members of Local 101-B, while keeping on the job Local 101 members with less seniority. Two 101-B men filed charges. NLRB found that both company and union had violated the Act and ordered them "jointly and severally" to make up back pay due the two workers.

LUMBER SQUEEZE—New England lumber buyers claim they are meeting tough competition in the Canadian markets, where much of the lumber used in the area originates. They assert that British and other foreign buyers are getting the lumber through higher bids, while buyers from the States are limited by price ceilings. In addition, poor logging conditions, due to the absence of enough snow, have curtailed the supply.

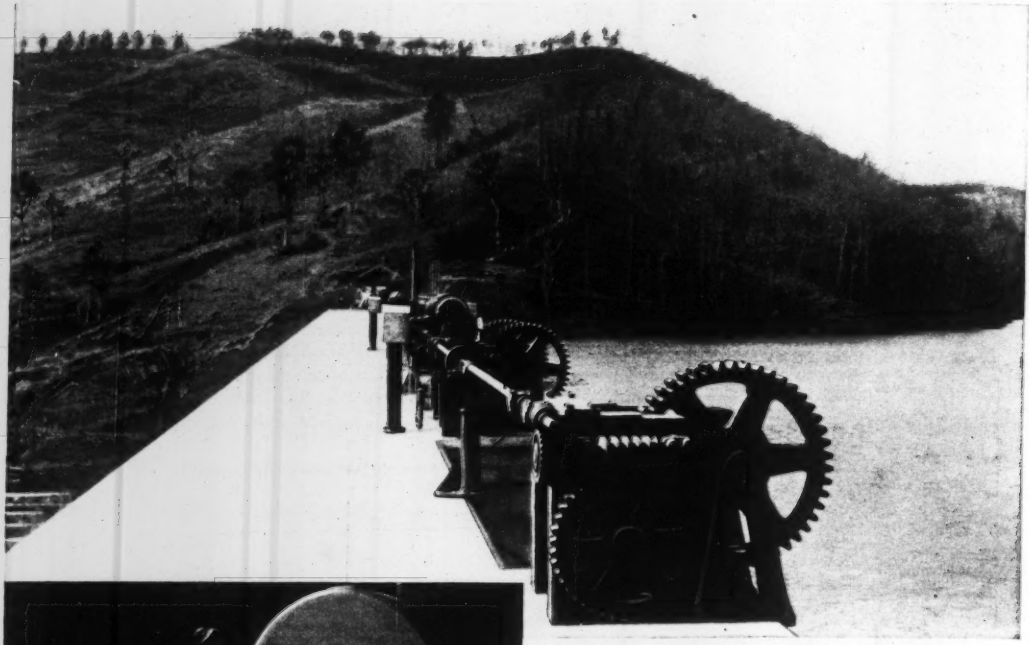
MILITARY CONSTRUCTION—Public works for the armed forces will take a big chunk of the next supplemental appropriation now being readied for Congress. Army, Navy and Air Force secretaries are trimming a couple of billion dollars out of the catch-all requests sent up to them by their subordinates—for theaters, PX's, laundries, officers clubs and similar deferrable items. But the military construction total will still run to multiple billions.

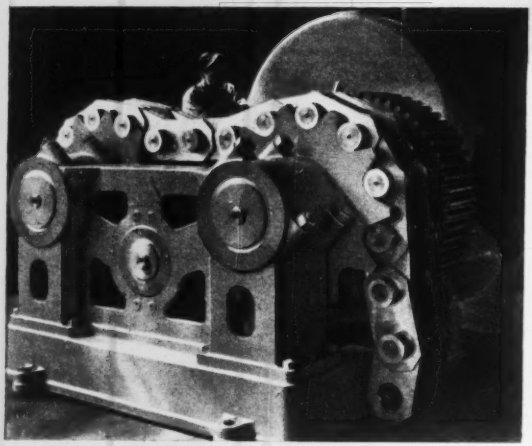
AMBASSADOR FLEMING?—There is pressure in Washington to ship Maj. Gen. Philip B. Fleming, Under Secretary of Commerce for Transportation, outside the U. S. Some ship owners, as well as truckers and people in the Office of Defense Transport Administration, would like to see Fleming named ambassador to Iceland or a Latin American republic. You can bet the President won't appoint Fleming to an off-shore post unless the general is willing.

ST. LAWRENCE HOT—Pressure for the St. Lawrence project has become so strong that the U. S. Chamber of Commerce finally is going to make a stand. Board of directors next week will decide on a referendum among the Chamber's 3,500 voting units. Big port and railroad cities are expected to out-vote the Great Lakes units that favor the project.

DEFENSE HOUSING—Relaxing of Regulation X and its counterparts in defense areas is the first step in the government program of getting private builders to erect homes for defense workers. Control agencies—the Housing and Home Finance Agency and the Federal Reserve Board—have already applied that method for the first 1,500 houses at the two new Atomic Energy Plants in Kentucky and South Carolina. The defense housing bill reported last week by the House Banking Committee would make the step mandatory.

GOVERNMENT DISPERSAL—The House Public Works Committee planned to act this week on a $145-million bill to disperse 40,000 employees of essential defense agencies to six sites in Maryland and Virginia.





Hoists

THE PROBLEMS involved in hoisting mechanisms and gates are many and varied. The solution of them is almost a science in itself. Hence, as both are vital equipment of every water power plant, great care must be given to their selection.

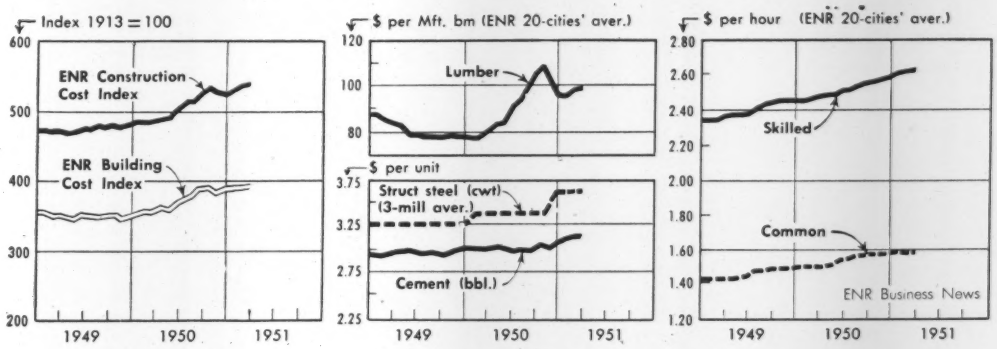
Our experience of more than 75 years, covering all branches of hydraulic science and machinery building is at your disposal for discussion of your hoist and gate problems. It can be invaluable to you—not only as a guide in making your analysis, but in assuring you of maximum returns on your investment! Perhaps, one of our standard hoists will meet your needs, as our line is very complete. If not, furnished with full data on your problem and its characteristics, we can design and build the equipment exactly suited to your requirements. Write us.

If It's Hydraulics-
Put It Up to Us!

S·MORGAN SMITH COMPANY
• YORK • PENNSYLVANIA • U·S·A·

POWER *by* SMITH

MARCH CONSTRUCTION SCOREBOARD

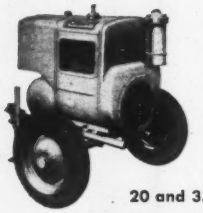


ENR INDEXES (1913 = 100)	Mar. '51	Feb. '51	% Change	Mar. '50	% Change
Construction Cost	537.90	536.74	+0.2	488.35	+10.1
Building Cost	397.99	396.95	+0.3	359.98	+10.6
MATERIAL PRICES (20-cities' average)					
Cement, bulk, per bbl	3.148	3.145	+0.09	2.956	+ 6.4
Structural Steel, (3-mill aver.), per cwt	3.650	3.650	0.0	3.400	+ 7.3
Sand, per ton	2.090	2.085	+0.2	1.973	+ 5.9
Lumber, 2x4 Fir, per M. ft. bm	109.353	107.970	+1.2	87.103	+25.5
Lumber, 2x4 Pine, M. ft. bm	92.450	92.000	+0.4	77.483	+19.3
Common brick, per M	31.175	30.725	+1.4	27.987	+11.4
Ready-mixed concrete, per c. y	10.925	10.904	+0.1	10.313	+ 5.9
Structural Clay Tile, 3x12x12 per M	142.556	138.940	+2.6	132.900	+ 7.2
WAGE RATES (20-cities' average)					
Common	1.595	1.593	+0.1	1.486	+ 7.3
Skilled (aver. 3 trades)	2.619	2.615	+0.2	2.469	+ 6.1
Bricklayers	2.895	2.895	0.0	2.733	+ 5.9
Structural Ironworkers	2.568	2.559	+0.4	2.436	+ 5.4
Carpenters	2.393	2.390	+0.1	2.239	+ 6.9

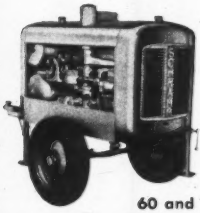
CONTRACTS AWARDED (thous.)	February 1951	February 1950	% Change	Two Months 1951	Two Months 1950	% Change
Total U. S. (ENR reported)	$1,271,065	$686,221	+ 85.2	$2,537,957	$1,601,696	+58.4
Private	932,632	412,034	+126.3	1,615,225	840,085	+92.2
Public	338,433	274,187	+ 23.4	922,732	761,611	+21.1
Federal	72,068	63,723	+ 13.0	355,663	339,307	+ 4.8
ENR Constr. Volume Index, '13 = 100	653	384	+ 70.0	659	450	+46.4
NEW CONSTRUCTION CAPITAL						
Total	507,773	428,240	+ 18.6	3,495,618	725,424	+381.8
State & Municipal Bond Sales	284,772	167,524	+ 69.9	422,377	390,008	+ 8.3
Corporate Security Sales	223,001	260,716	− 14.5	397,356	335,416	+18.5
Federal (non-federal work)				73,425		
Federal (federal work)				2,602,460		

MATERIAL SHIPMENTS & LABOR SUPPLY	January (J) December (D) 1951	1950	% Change	Twelve Months 1950	1949	% Change
Cement, thous. bbls., Bu. of Mines	12,477(D'50)	11,628(D'49)	+ 7.3	227,788	206,193	+10.4
Fabr. Struc. Steel, thous. tons, AISC	172(J)	135(J)	+27.4	1,932	1,854	+ 4.2
Lumber, mil. ft. bm., NLMA	2,878(D'50)	2,985(D'49)	− 3.6	39,719	31,981	+24.2
Lumber Prod., mil. ft. bm., NLMA	3,009(D'50)	2,950(D'49)	+ 1.8	39,381	31,987	+23.1
Contract Constr. Employ., thous. BLS	2,266(J)	1,919(J)	+18.1	(Av.) 2,313	(Av.) 2,155	+ 7.3

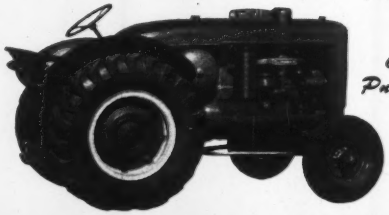
from the ground up—



20 and 35



60 and 105
Pneumapower



60 and 105
Pneumatractor

There's a SCHRAMM Air Compressor to fit your air needs!

MODELS 20 and 35... for Tire Inflation, Scaling, Impact Wrenches, Grease Guns, Paint Sprays and Road Markers.

MODELS 60 and 105 Pneumapower . . . For jobs where large compressors are not required; Riveting, Tamping, Waterproofing, and Insulating.

MODELS 60 and 105 . . . *Pneumatractor* Self-Propelled. For Trench Work, Loading and all air applications.

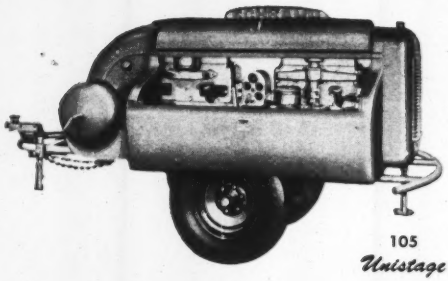
MODEL 105 Unistage . . . Equipped with large size tool boxes capable of hauling complete assortment of construction tools.

MODELS 210, 315 and 600 . . . Large compressors for operating multiple tool combinations on big engineering projects.

TO GIVE YOU A COMPLETE PACKAGE

The Schramm line of Construction Tools includes: Rock Drills . . . Wagon Drills . . . Paving Breakers . . . Clay and Trench Spades . . . Backfill and Tie Tampers . . . Track Spike and Form Pin Drivers . . . Sheeting Drivers . . . Chain Saws . . . Concrete Vibrators . . . Paint Sprays . . . Tools for Breakers and Diggers . . . Air Hose and Accessories.

REMEMBER. There's a Schramm Air Compressor and auxiliary tools available for your many compressed air needs. For complete details, write today.



105
Unistage

210, 315 and 600
Unistage

SCHRAMM INC.

The Compressor People

WEST CHESTER • PENNSYLVANIA

New bond stresses save steel

As predicted, the American Concrete Institute at its annual meeting approved higher bond stresses for deformed reinforcing bars meeting American Society for Testing Materials Specification A305 (ENR Mar. 1, p 23). With these new bars, hooks will seldom be required. Consequently, use of the new ACI bond stresses for these bars will conserve steel and reduce labor costs.

While the ACI membership still has to ratify this revision to the institute's building regulations, there is no need to wait for this formal approval, which is a certainty. The new bond stresses are conservative; they are based on extensive tests and have been under discussion for several years. Hence, in view of the need for conserving steel, immediate steps should be taken to revise building codes to conform with the ACI recommendations and the ASTM specifications for the new-type deformed bars. Structural designers and building officials should no longer require that A305 bars be hooked when satisfactory anchorage can be obtained with straight bars in accordance with the new stresses.

St. Lawrence project favored

Contrary to conclusions expressed in this page a few weeks ago, the St. Lawrence power and navigation project appears to be in line for early approval by Congress. That was made fairly certain a few days ago when Mobilization Director Charles E. Wilson told the Public Works Committee of the House that the ship canal is essential to this country's long-range defense program. Only by starting the project soon, Mr. Wilson said, can the U. S. be assured of an adequate supply of ore for its rapidly expanding steel industry, should the period of international tension continue for ten or more years.

Now that the project has Mr. Wilson's backing, opponents in Congress can hardly be expected to do more than delay approval. Before actual work can start there will need to be a new understanding with Canada as to apportionment of the costs and as to when Canada will undertake construction of the ship-canal work wholly within her borders, chiefly new locks and enlarged canals to replace the Soulanges and Lachine canals.

While these preliminaries are under way we hope that there will also be a restudy of the question of depth of the ship canal. When the Welland Canal was rebuilt by Canada in the period 1913-1930, its great locks were designed for vessels of 27-ft draft, and that depth (30 ft over lock sill) was taken as the standard when design studies were made for the new St. Lawrence Canal. But a large number of ships in the American merchant fleet now have a deeper draft. Hence it seems desirable to determine whether that actually is a handicap to full use of the proposed ship canal, as some people maintain, or whether it is largely theoretical. It should be no handicap to the ore carriers now used on the Great Lakes since they are built to pass through the locks at Sault Ste. Marie, of which only the new MacArthur Lock has a depth over the sill of more than 30 ft. Its depth at the sill is 31 ft. If the 27-ft draft limitation will be a serious handicap, now is the time to do something about it.

Polarized lights on highways

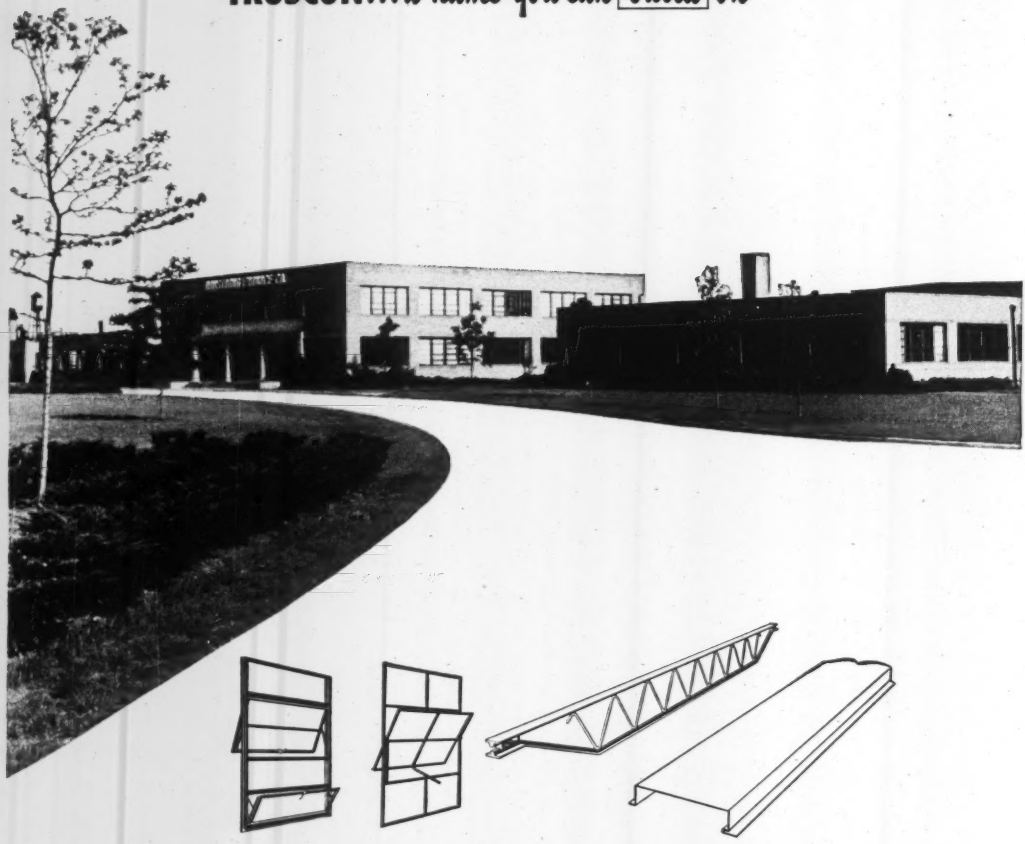
Legislation designed to advance the day when polarized headlights may be required on all motor vehicles on highways has been introduced into the legislative chambers of Massachusetts and New York, according to a bulletin of the National Highway Users Conference. The bill in Massachusetts would require a polarized viewer, two polarized head lamps and two non-polarized passing lamps on all cars manufactured after a specified date, but only if states with an aggregate population of 50,000,000 people adopt similar legislation. In New York's bill this equipment would be required after Jan. 1, 1954.

To the average driver, accustomed to being blinded by the undepressed headlamps on autos in the opposite lane, this doubtless appears to be a desirable trend. But many authorities on highway safety view such proposals with some concern. They consider the polarizing viewers—which are designed to bridge the gap until the day when all cars have polarized headlamps—as especially dangerous because they reduce very materially the driver's capacity to see dimly lighted objects. Also, a polarized headlamp is not as efficient a source of light as an unpolarized light. Therefore, unless more power is built into polarized lamps, the driver of a car with such lights sees less of the road ahead at night.

These and related facts were brought out at the 1947 meeting of the Highway Research Board at a session put on by the producers of polarizing products. After a bright picture of the many advantages of polarized headlamps had been painted for the audience, highway safety engineers and automotive manufacturers took the floor to point to some of the dangers of that type of lighting, especially during the transition period when both types of headlamps would be on the road. Auto builders cited the increased cost and questioned the advantages over the improved types of headlamps on all modern cars.

These are considerations that need to be studied thoroughly before the use of polarized headlamps is required by law.

TRUSCON...a name you can build on



built better with the big 4...

Internal strength, adequate roof protection, and finished architectural appearance, are achieved in these streamlined Armstrong Furnace Company structures, Columbus, Ohio, through the use of the Truscon engineering products listed below:

1. Truscon Architectural Projected Steel Windows. Extremely rigid construction, ample ventilation and freedom from drafts, and attractive architectural design are features of this widely-used window.

2. Truscon Pivoted Steel Windows. Strong, slender muntin bars admit maximum daylight. Sturdy construction. Easy operation.

3. Truscon "O-T" Open Truss Joists. A Warren truss having top and bottom chords of wide tee-shaped members, and a plain round continuous member. Rigid, fire-resistant, economical.

4. Truscon Ferrobord Steeldeck. Strong, light weight roof decking, for flat, pitched or curved roofs. Can be insulated to any desired degree of insulation.

Credit: Robert W. Setterlin & Sons, Contractor. M. E. Miller, Consulting Engineer.

TRUSCON
MARK OF MERIT
PRODUCTS

See SWEET'S for complete details on the entire line of Truscon Steel Windows for every purpose; and write for detailed literature on all other Truscon Steel Building Products.

TRUSCON® STEEL COMPANY YOUNGSTOWN 1, OHIO

Subsidiary of Republic Steel Corporation

ENGINEERING NEWS-RECORD

MARCH 8, 1951 VOL. 146 NO. 10

Controls aired at AGC meet; equipment prospect detailed

Worst bottleneck for construction is steel; timetable for new steel announced; Creedon speaks at first public appearance; Maxon becomes AGC president at Boston

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Associate Editor

"The construction industry has a higher position now in the government . . . than it ever had before."

Thus Frank R. Creedon prefaced his remarks about controls before the Associated General Contractors of America convention at Boston last week. It was his first public talk since he began working on construction controls with the National Production Authority. As Assistant Administrator, for facilities and construction, Creedon had the answers to many of the questions uppermost in the minds of 850 construction men at the meeting.

More answers were supplied by John L. Haynes director of NPA's Building Materials Division, and by Ralph K. Stiles, President of the Construction Industry Manufacturers Assn.

These men's answers pertained to materials and equipment. Information and speculation on labor controls was notably absent from speeches and discussions.

Explaining his remarks about construction's high position in government, Creedon noted that one of NPA's three main branches is the Facilities and Construction Bureau. In the World War II controls setup, construction was handled in subdivisions of main branches.

He went on to describe the functions of the Bureau's five divisions, then to tell what is being done about "the 564 item-steel capacity."

• **Steel gets attention**—The activities of one division—construction controls—have been aimed particularly at carving slices of the steel supply from least essential fields and making them available to the military. Original order M-4, banning amusement work, was a response to the military's estimate that it would need 15% of U.S. structural steel production. Suppliers had to reserve 15% of their output for Defense-Order priority business.

Percentage of military steel requirements rose progressively to 35% in January, and thereafter M-4 was broadened to include commercial work.

As to steel capacity (and Creedon considers steel the key material) NPA's amortization division has approved stepped-up amortization plans for 13,750,000 tons of new-capacity construction. (tonnage figures are for annual output.)

More important than "how much" expansion is coming, is "when?" according to Creedon. He supplied answers as follows:

By July 1951, 1,916,000 tons will be added; by year-end, 2,732,000 tons more; by July 1952, 3,209,000 more, by end of '52, 4,514.0 tons more; in 1953, 1,346,000 tons more. Total of these figures is 13,717,000 present capacity is about 105,000,000 tons annually.

Creedon also noted that steel-mill construction requires a large amount of steel—a fact that for the time being aggravates the critical nature of steel demand.

John L. Haynes pointed up another steel-shortage-aggravating factor in the shifting construction economy. Industrial work, which now is expanding, takes two to three times as much steel in proportion to dollar volume as does housing, which now is shrinking.

Haynes was forecasting construction's output for 1951. With the shift to greater use of critically-short steel, construction dollar volume may be held two to three billion dollars short of the 1950 figure, which Haynes put at $28 billion.

Copper and zinc will take more cutbacks from civilian use in the months to come, Haynes said, inserting a plea for more standardization of types and sizes of non-ferrous metal products. Such standardization would cut metal use only 5% but it would save much more in production time.

• **Information, please**—Haynes' and Creedon's talks were followed by one of the AGC convention's liveliest question-and-answer sessions.

H. C. Turner, Jr., president of Turner Construction Co., was a leading questioner. He asked whether construction's use of copper is significant enough to warrant work cutbacks that are expected to amount to as much as $5 billion. (construction takes about a quarter of all copper.)

Another question: Will committees such as the Construction Industry Advisory Committee be called on to help in the construction-certification procedure? (NPA would be glad to have such help and will consider the suggestion.)

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Caution marks NPA permit handling

"Hardship cases first" is the order of the day in National Production Authority offices designated as compliance-controls centers to pass upon applications for commercial construction since the "freeze" ended on Feb. 15.

Builders began submitting some applications immediately after the freeze went into effect on Jan. 15. A considerable number of hardship cases were reported—generally instances where materials were ordered and fabricated and some work done on the site.

The first two weeks of licensing have shown that NPA regional directors are fully sympathetic to an applicant's justified need. This point was established through interviews made by ENGINEERING NEWS-RECORD correspondents in regional and district offices of NPA designated to process applications (ENR Feb. 22, p. 23).

Interviews with contractors, architects and owners echoed these findings with few exceptions.

There are cases where the going is rougher. A few regional directors were found who are not sure of themselves and who process few applications without sending them to Washington for review.

In fact, these few are reluctant to talk, insisting that they are "not permitted to give out that kind of information", when asked what kind and how many applications they are putting through.

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• **Cautious approach**—Applicants and government alike have made caution the watchword in the early stages. Many builders file for every type of construction—to be absolutely certain they are not running afoul of a ruling. Large operators generally are as familiar with NPA rulings and orders as the government men and file applications in full confidence.

Applications which have brought some head-scratching are those where proposed buildings are for mixed purposes, such as combination office space and stores or restaurant on the first floor.

There is variance among the staffs of controls offices. For the most part, they are following directives as they come from headquarters and lean over backward to give the applicant a green light.

In some cases, where plans were complete and materials ordered when the freeze took effect, the right to build was granted. Again, there are those officials who are new on the job and afraid to make a decision without first getting the blessing of Washington.

• **Convenience rates too**—Construction that comes under the heading of public health and safety is processed at once without difficulty. However, the heading "convenience" takes more study. One mid-Western regional director plans to approve the extensive remodeling of several shops near a recently completed apartment development—because the retail project will be a direct convenience to the residents, who otherwise would have to travel a dozen blocks for stores. The same work, he said, probably would not be allowed in an existing retail district.

There has been little trouble with interpretations of the M-4 forms by applicants, although Washington's mind-changing causes minor problems.

The relatively limited flow of applications so far is due partly to the winter season. Thawing of the ground may release more requests.

The larger builders and contractors seem pretty well satisfied with the commercial building-controls setup. They claim that under this order there will be a more equitable distribution of materials.

Of course there are those who are inherently suspicious of government operations and what they call "red tape." Some contractors complain because of loose interpretations of what they feel should be items pretty well defined.

• **Differing opinions**—An Associated General Contractors official commented that the operation seemed to be an unknown factor all the way through—a very mysterious thing." He added that members come to the AGC for advice and "we can't help them."

By contrast, a Los Angeles contractor reports that his hardship application to finish construction of a large market was granted 10 days after the end of the freeze, although he was 47th on the list.

Other district NPA offices, not designated officially, are taking applications and doing what they can to assist the busy, larger offices. Many municipal building-permit office staffs know what is likely to receive government approval and nip in the bud those found wanting.

Licenses for construction of commercial buildings are being issued steadily, if cautiously. Faster processing is expected later.

NPA answers controls questions

The National Production Authority last week got out a statement that tries to clear up some of the misunderstandings about what the M-4 order on commercial construction does and does not cover.

The statement clears up many questions that contractors and owners have been asking of the Construction Controls Division, headed by Rufe Newman. The government people don't think this statement will be the last, for as control pinches more and more, there will be more requests for interpretations.

Here are interpretations of some of the most-frequently asked questions:

• Construction of radio and television stations may be started without NPA authorization so long as the Federal Communications Commission has approved the project.

• A restaurant in a factory building used exclusively by the factory's workers may be commenced without NPA approval; but an okay is needed if the eating place is open to the public.

• You may not commence construction of any warehouse for storage of consumer goods where the warehouse is to be used incident to distribution of the goods; but a manufacturer's warehouse which is directly connected with the production of the item is permissable.

• Garages for parking only by residents of homes or apartment houses may be started without NPA authorization; but NPA must approve garages that provide commercial services. And NPA must approve plans for building public garages or public parking facilities.

• The mere signing of contracts for a construction job or making of building materials does not constitute commencement of construction within the meaning of the regulation; but the driving of a permanent piling over a substructure of a building does constitute commencement.

• NPA approval is needed for construction of hangars for maintenance, repair or storage of commercial aircraft.

• No approval is needed for school buildings, libraries and churches; but a YMCA, a 4-H building or a community center does require an okay under the regulation requiring licensing of community or neighborhood buildings.

• Food processing plants need no NPA clearance.

• Construction of these facilities is not prevented under the section prohibiting certain types of building: Toilets in parks and forests; site clearings in parks and forests; gravel roads, parking areas, walks, beaches and picnic tables in parks and forests.

• Terminal facilities for trucking companies or common carriers may be commenced without clearing, provided no part of the terminal is to be used by anyone except the company or common carrier.

• A clinic building is not an office building within the meaning of the order, thus no NPA okay is needed.

• Architect fees and legal fees need not be included in computing construction costs on a license application.

• A postoffice building to be used exclusively as a postoffice needs no license, but, if other services are to be performed in the building, authorization is required.

• Alterations made in buildings, such as department stores or offices, which involve merely shifting of portable partitions are not construction according to the order.

AGC meeting hears more about controls

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Another: Why shouldn't it be all right to let non-essential construction go ahead in communities where men and materials are available? (to reflect the spirit of the law—that the economy shall be dislocated as little as possible—such cases will get appropriate consideration.)

Another: What will be the effect of the impending Controlled Materials Plan? (some benefit to all because the flow of steel, copper and aluminimum will be regularized.)

Effect of CMP will have a lot to do with the construction machinery business, according to Ralph K. Stiles. Noting that the pinch of steel already is embarrassing many equipment manufacturers, he said, "Until we get CMP we will remain in a state of utter confusion."

Stiles told contractors they'd better hang on to their machines because they will be hard to get for about a year. Fortunately the construction industry is in much better shape equipmentwise than it was in 1940. Meanwhile, contractors will see great equipment "stockpiles" around the country—the effect of government procurement. That procurement, of course, is taking most of the 1951 output. About 25% of the 1951 output will be available for civilian use, Stiles said.

He then summarized a CIMA equipment outlook survey as follows:

- **Motor graders:** 6,000 of an annual 8,000 output will go to military use in 1951; 3,500 to 4,000 thereafter.
- **Pumps:** There is a continuous heavy backlog of civilian orders for pumps.
- **Loaders:** Supply is good, and military is not taking many (front-loaders, bucket and belt loaders).
- **Rollers and compactors:** Supply tight, with prospects for 50-50 distribution to military and civilian uses.
- **Tractors:** Demand heavy, with about half of output going to military; because tractors are basic and essential in construction, overall production is not expected to be cut.
- **Scrapers:** Military orders are heavy in this category; difficulty of getting plate and structural stock now has the scraper manufacturers producing below capacity. Civilian users will be confined to basic-material production such as for iron ore, copper and Bauxite.
- **Power cranes and shovels:** Production is going up, and supply for both military and domestic use should be good in all categories.
- **Bituminous equipment:** While military purchases are not heavy yet, shortage of steel and components alone will put bituminous equipment in short supply in 1951.
- **Rubber:** There is a temporary tightness here; it should disappear by midyear.

Off-highway trucks and trailers: Output in this field is three times that of the World War II years; military is expected to procure about 15% in 1951, with another 20% reserved for military construction contracts; availability should be good in 1951, Stiles said.

CONTROLLERS—Chief interest at Associated General Contractors of America convention in Boston last week centered on these federal construction controls men. They are: Left, John L. Haynes, director of the Building Materials Division of National Production Authority's Facilities and Construction Bureau; and right, Frank R. Creedon, NPA assistant administrator, who is in charge of the bureau.

Machinery and materials also were covered by Walter L. Couse, national president of AGC, in his presidential address.

Reviewing 1950, Couse said that before Korea, sharp competition for work had led industry observers to fear that there would be undesirable corner-cutting on work. However, inventiveness brought forth economies that put the industry on a still sounder basis.

As to construction labor, Couse noted a great reduction in jurisdictional disputes, said he heard one man say that the few disputes of 1950 might rather be called "jurisdictional discussions."

Labor's speaker at the convention was Joseph D. Keenan, secy.-treas., Building and Construction Trades Council, AFL. Keenan pleaded for greater "voice" by the construction industry in administering the controls machinery.

Other principal speakers included Daniel L. Marsh, president of Boston University; Wesley F. Rennie, executive director of the Committee for Economic Development; Maj. Gen. Lewis A. Pick, chief, U.S. Corps of Engineers; Read Admiral Joseph F. Jelley, chief Navy Bureau of Yards and Docks, Millard F. Caldwell, Jr., administrator, Federal Civil Defense Administration.

Marsh and Rennie were the only speakers on social science (a field that in other postwar years has occupied much AGC convention time). Marsh reviewed the foundations of the republic in a simple and instructive manner, saying the republic will last as long as the founders' ideas prevail.

Rennie listed four economic policies essential in these times:

1. Delete government expenses not immediately needed for defense,
2. Increase taxes,
3. Check expansion of bank credit,
4. Institute a national savings program.

- **Army work under DO**—Foreseeing $2.4 billion of Army engineer work in 1951, General Pick noted that most of it would be under Defense-Order priorities. So far, most material acquisition difficulties under the DO system have been due to the contractor's failure to order as soon as he could have. (This indictment came from the material suppliers), rather than to defects in the DO system.

Admiral Jelley called for speed and more speed to catch up with the Communists, who never let down their mobilization after World War II ended. Further, he asked for universal recognition of the fact that whether a man wears a uniform, a business suit or overalls, he's in a vital defense position. All must be coordinated.

As to the Navy's building for defense, Admiral Jelley said new work is mostly in lines of new warfare techniques. Not much rehabilitation of existing facilities is needed because ". . . The Navy had the foresight to build well."

Turning its attention to civil defense, the convention heard Caldwell, who appraised the population's ability to "take it," and thanked the contractors for their civil defense work.

On this point, Couse, in his address, said that the authorized government agencies in civil defense "now look to us as the organization to coordinate all work involving clearing and rehabilitation of bombed areas."

At the convention's closing session, Couse was succeeded as president by Glen W. Maxon, president of Maxon Constr. Co., Dayton, Ohio. The new vice-president is Arthur S. Horner, president of the Horner Const. Co., Denver, Colo.

Floods damage large Puget Sound area

Damage caused by recent floods in the Puget Sound area has been estimated variously at from $4,000,000, by the Corps of Engineers, to $50,000,000, by Gov. Arthur B. Langlie of Washington state.

About 4,600 persons were driven from their homes. Another 650 are homeless in British Columbia's flooded Fraser River Valley farther North.

Greatest damage was wrought by the Skagit River, where the highest water in many years forced evacuation of more than 1,000 persons from the low-lying Skagit delta. A dike near Stanwood was dynamited to speed up drainage while a levee under construction by the Corps of Engineers near Milltown was washed out.

The Skagit damage would have been worse if the Seattle city light company had not closed the valves at its Ross Dam and impounded an additional 73,925 acre-ft of water in four days.

Flooding of the Green River, south of Seattle, called attention to a proposed flood control project there which is awaiting appropriations. Army Engineers have recommended a flood control dam. Congress and the President have authorized it. King County has set aside $500,000 for it and the 1949 legislature appropriated $1,500,000, contingent on a federal appropriation to defray most of the cost. The 1951 legislature, now in session, is expected to renew the appropriation in the hope that federal funds may be attained.

The floods were caused by heavy rainfall in the Cascade Mountains, melting some of the snow. Cool weather caused the floods to recede after five days or else the damage might have been more severe.

ACI awards given to five engineers

The American Concrete Institute at its annual convention in San Francisco gave awards and honors to five men in recognition of their contributions to concrete design. (ENR March 1, p. 23). Charles S. Whitney, of Ammann and Whitney, consulting engineers, New York and Milwaukee, was awarded the Alfred E. Lindau Award . . . "in recognition of his many contributions to reinforced concrete design practice."

W. S. Colby, structural engineer, Stone and Webster Engineering Corp., Boston, Mass., received the ACI Construction Practice Award.

J. R. Leslie and W. J. Cheesman, research engineer and assistant research engineer, respectively, Hydro-Electric Power Commission of Ontario, Toronto, Ont., Canada, received the Wason Medal for "noteworthy research" dealing with the use of the Soniscope, which develops ultrasonic pulses in a material and measures velocity of their transmission through it.

The velocity was found to be a reliable measure of the condition of concrete, particularly useful in deterioration studies. The existence and extent of internal cracks and the depth of surface cracks can also be determined with the apparatus.

Harry F. Thomson, manager, Redi-Mix Concrete Division, Material Service Corp., Chicago, was the recipient of the Wason Medal for "the most meritorious paper" published in the ACI Journal.

Following the presentation of awards, President Jackson announced that Harrison F. Gonnerman, assistant to the vice-president for research development, Portland Cement Assn., Chicago, and Frank E. Richart, research professor of engineering materials, University of Illinois, Urbana, were elected to honorary membership.

Highway engineers meet in Illinois convention

The twenty-seventh annual Illinois Highway Engineering Conference was held on the campus of the University of Illinois last week under the sponsorship of the Department of Civil Engineering of the University, the Illinois Division of Highways and the Illinois Association of County Superintendents of Highways.

Ellis Danner, professor, department of civil engineering, was director of the conference.

Resolution backed to clear Jersey ship-rail terminal

Plans for a $35,000,000 ship, rail and truck terminal on New York Bay have been approved by the Jersey City administration and submitted for approval to the municipal Department of Revenue and Finance. The terminal would be constructed on city-owned property by the Foundation Company of New York.

The terminal would ultimately cost $150,000,000 under the long-range plan proposed by the company. The resolution would enable the city to lease for 49 years property near Bedloes Island.

Bethlehem Steel expands: $100 million in upper N. Y.

Under way at Lackawanna, N. Y., is an expansion program destined to cost an estimated $100,000,000. Engineers and draftsmen of the Bethlehem Steel Co. are rushing plans which will raise production on the 1300-acre property to 4,680,000 tons of steel a year.

The program calls for four new open hearth furnaces, 76 additional coke ovens, and facilities for finishing steel, as well as a new blast furnace.

ROCK WORK—Working in columnar basalt, the Guy F. Atkinson Co., contractor, uses an electric dragline with a 90-ft boom and 6-yd rock bucket to muck out the first section of the Potholes East Canal in East Central Washington. Canal is part of the Bureau of Reclamation's Columbia Basin project in that area. Holes are drilled 24-ft deep on a 9 by 10-ft pattern, then sprung and loaded with 40% dynamite.

CONSTRUCTION BUSINESS

Most construction activity in South, Mid-West and West of Mississippi

Engineering construction contracts in the United States are running 58% higher in total value than they were a year ago. The 2-month total is $2,537,957,000 as reported by ENGINEERING NEWS-RECORD.

But this 58% increase is not distributed evenly geographically. The South shows a 209% increase to a total of $589 million for the two months. Mid West chalks up a 106% increase to $450 million, states West of the Mississippi reported a 82% increase to $572 million and Middle Atlantic states stay on the plus side with a 49% rise to $590 million. But both New England and the Pacific states are down 30% to $63 million for New England and to $274 million for the West Coast area.

The $2.5-billion total for the whole country is an all time high record. It includes $1.6 billion for private contracts, an all time record, and 92% more than private work put under construction in 1950 in the first two months. It includes also public works to the tune of $923 million, a 21% increase over similar 1950 volume.

The unprecedented rush of industrial building has put $1,026 million worth on the new contract books for a 614% increase over the 1950 rate. This total tops all previous 12-month totals as reported by ENGINEERING NEWS-RECORD except 1946 and 1950.

Privately financed mass housing is down 27% from its high rate of 1950. Commercial building is down 17%.

Public housing is up to $133 million for a 365% rise above its slow start in 1950. Road work is running 8% above last year and bridge construction is 11% higher.

Construction costs level off

Up only small fractions of a point, the March values of the ENGINEERING NEWS-RECORD Construction and Building Cost Index are 537.90 for the former, 397.99 for the latter. This is a rise of 0.2% since February first for the Construction Cost Index and a rise of 10.1% since March last year. It is a rise of 0.3% for the Building cost index in the past month and of 10.6% in the past year.

Back of these small increases are these small changes in the 20-cities averages of materials prices and wage rates: cement is up 0.09% for the month, 6.4% for the year; structural steel (mill prices) are unchanged for the month but up 7.3% for the year; lumber is up 1.2% for the month for fir, 25.5% for the year, pine up 0.4% for the month, 19.3% for the year.

Common wage rates inched up 0.1% for the month and are up 7.3% for the year; skilled wages are up 0.2% for the month and 6.1% for the year. This average is made up of bricklayers' wages which show no change for the month but are up 5.9% for the year; of structural ironworkers whose wages climbed 0.4% during the month, 5.4% during the past year, and carpenters whose rates increased 0.1% during the month and 6.9% during the year.

Building materials output down in December

Production of building materials fell off to 160.8 in December from 173.4 in November and a high of 192.2 in August as measured by the U. S. Dept. of Commerce Index of Production. This is based on 1939 = 100. Adjusted for seasonal trends, however, December production held up to 181.9 the high rate for the year.

Lumber production in December was down to 125.6 from a high of 164.9 in August. Hardwood flooring output fell off to 169.8 from an August high of 203.7. Softwood plywood output is 279.1 for December, 300.9 for its October high.

Brick turned out in December gets an index value of 124.7, down from an October high of 161.5. Cement production rates 187.6 for December compared with October's 220.7.

Fabricated structural steel for December has a production index of 146.3, down from an October high of 152.8, while concrete reinforcing bars get a December output rating of 143.9 compared with August's 160.4 high.

Both gypsum board and gypsum lath held their year's highest rate of output through October, November and December, the board with a production index of 794.2 and lath with an index of 311.3, both based on 1939 = 100.

ENGINEERING CONSTRUCTION CONTRACTS REPORTED TO ENGINEERING NEWS-RECORD—FEBRUARY, 1951

Engineering News-Record *reports continental U. S. Construction projects of the following minimum costs — Waterworks, excavation, drainage and irrigation,* $34,000; *other public works,* $60,000; *industrial buildings,* $82,000; *other buildings,* $300,000

Four Weeks — Thousands of Dollars (000 Omitted)

	February, 1951						U. S. Cumulative Two Months		%	Canada
	New England	Middle Atlantic	South	Mid-West	West of Mississippi	Far West	Total U. S.	1951	1950	Change '50 to '51	Feb., 1951
Public Works											
Waterworks	133	1,681	1,181	1,508	10,266	2,844	17,613	30,121	50,226	−40	3,613
Sewerage	2,881	3,387	6,188	1,027	5,349	4,844	23,676	52,992	34,834	+52	1,120
Bridges	1,797	1,592	2,335	3,643	5,042	3,398	18,807	44,473	39,921	+11	1,395
Earthwork and waterways	1,028	229	13,787	436	3,713	6,752	25,945	40,598	48,774	−17	5,265
Streets and roads	3,798	13,760	17,472	13,944	18,413	5,671	73,058	132,204	122,745	+ 8	5,447
Public buildings, residential	7,407	3,053	29,987	4,146	5,567	186	50,346	133,772	28,782	+365	3,366
Other public buildings	4,438	16,971	26,881	13,225	15,412	11,726	88,653	418,462	372,237	+12	18,553
Unclassified	348	6,843	11,301	354	14,952	6,537	40,335	70,110	64,092	+ 9	3,728
Total public	21,830	47,516	110,132	38,283	78,714	41,958	338,433	922,732	761,611	+21	42,487
Federal government (included in above classifications)	1,276	6,133	27,231	2,767	19,330	15,331	72,068	355,663	339,307	+ 5	3,945
Private											
Bridges	.....	.....	.....	.....	.....	.....	.....	2,109	1,390	+52	.....
Industrial buildings	5,012	310,669	34,535	116,197	166,130	15,272	647,815	1,026,361	143,797	+614	14,816
Com'l. buildings, residential	3,500	46,200	16,166	14,625	55,190	55,125	190,806	361,604	498,610	−27	8,925
Other commercial buildings	300	9,314	5,299	13,362	7,259	1,710	37,244	118,228	143,114	−17	5,640
Unclassified	.....	94	2,541	763	13,192	40,177	56,767	106,923	53,174	+101	260
Total private	8,812	366,277	58,541	144,947	241,771	112,284	932,632	1,615,225	840,085	+92	29,641
Total Engineering Construction:											
Feb., 1951 — 4 weeks	30,642	413,793	168,673	183,230	320,485	154,242	1,271,065	.....	.....	....	72,128
Jan., 1951 — 4 weeks	32,423	175,779	420,580	266,749	251,846	119,515	1,266,892	.....	.....	....	122,986
Feb., 1950 — 4 weeks	57,860	191,947	100,214	76,498	164,696	95,006	686,221	.....	.....	....	32,433
Two Months — 1951	63,065	589,572	589,253	449,979	572,331	273,757	.....	2,537,957	.....	+58	195,114
Two Months — 1950	90,471	396,902	190,993	218,862	314,338	390,130	.....	.....	1,601,696	....	60,208
% Change '50 to '51	−30	+49	+209	+106	+82	−30	.....	.....	.....	....	+224

BIDS AND BIDDERS

(Major project news received after Construction Reports, page 74, went to press.)

Chemical Plant—Blaw-Knox Construction Co., Pittsburgh, Pa., has been awarded contract for plant to manufacture chlorine and caustic soda, at McIntosh, Ala., for the Mathieson Alabama Chemical Co., subsidiary of Mathieson Chemical Corp., Baltimore, Md. estimated cost is about $10,000,000.

Pipe Line—Algonquin Gas Transmission Co., Boston, Mass., plans 253 miles pipe line and 279 miles materials, all of welded steel pipe, from the New York State border through Massachusetts. Work on $30,477,800 project will begin in Spring.

Plant—Sordoni Construction Co., Wilkes-Barre, Pa., and G. D. Campbell Building Co., Poughkeepsie, N. Y., will build a $6,000,000 addition to International Business Machines Corp., plant in Poughkeepsie, to double size of project. Sleelye, Stevenson & Value, New York, are consulting engineers.

Commercial Center—Jonathan Woodner Co., Cincinnati, O. plans 11 story office building and 5 story apartment, with parking areas in Cincinnati, to cost about $12,000,000. Ketchem, Gina & Sharp, New York, N. Y. are architects.

Cement Plant—Spokane Portland Cement Co., Spokane, Wash., plans to spend $3,500,000 to expand it's plant at Irwin, Wash.

Office Building—Prudential Insurance Co., Newark, N. J., plans 35 story office building over air rights of Illinois Central Railroad, at Randolph St., Chicago. Project will cost about $30,000,000. Naess & Murphy, Chicago, are architects.

Postal Station—Redfern Construction Co., Ltd., Toronto, Ont., submitted low bid of $2,957,000 for constructing Postal Station Q, at Toronto, Ont., when the Department Public Works, Ottawa, opened bids Feb. 28. J. H. Hooper, Toronto, is engineer. G. Brault, is architect for owners.

Housing—Harold F. Goetz, North Tarrytown, N. Y. will construct by own forces a $3,000,000 housing development in North Tarrytown. Karl Bloch, Merrick, N. Y., is architect.

Albeni Falls Dam—Donovan-James Construction Co., Seattle, Wash., was low bidder at $3,839,148 for second stage of construction Albeni Falls Dam on Priest River, Idaho, when the U. S. Engineers, Seattle, opened bids Mar. 1.

Transit Shed—Los Angeles Harbor Department, City of Los Angeles, postponed opening bids until Mar. 28, for transit shed facilities, at Berths 196 and 197 at Wilmington, estimated cost is $3,000,000. E. C. Earl, is harbor engineer.

Pipe Line—W. H. Hinman, Inc. and the Associated Pipe Line Corp., Westbrooke, Me., have been awarded a $4,000,000 petroleum pipe line in Maine, by the Department of the Air Force, Washington, D. C.

Bridge — Massachusetts Department Public Works, Boston, Mass., will open bids Apr. 3, for superstructure for bridge over Merrimack River, between Newburyport and Amesbury. Cost will be about $2,500,000.

Department Store—O. H. Martin, Sharpsburg, Pa., will make $2,000,000 alternations for Rosenbaum Co., Pittsburgh, in department store. E. E. Ashley, New York, N. Y., is architect.

Electric Plant—Macco Corp., Paramount, Calif. will remodel steam generating plant at Long Beach, Calif., for the Southern California Edison Co., Los Angeles. Cost is about $2,321,000.

Carbide Metal Plant—Carblov Co., Inc., Detroit, Mich., plans $2,000,000 carbide metal plant at Edmore, Mich. Smith, Hinchman & Grylls, Detroit, are engineers.

Bond Issue—City of University City, Mo., voted $2,185,000 bonds for sewers, rubbish disposal plant, and recreation facilities.

Gas Pipe Lines—Oklahoma Contracting Co., Inc., Dallas, Tex., will build gas pipe line near Falfurrias, Tex., for the Tennessee Gas Transmission Co., Houston, at $3,265,000.

Bridge—State of Maine, Augusta, plans Bangor-Brewer Bridge over Penobscot River, Penobscot County. Cost will be about $2,300,000. Lucius Barrows, Augusta, is state highway commissioner.

Power House—Grafe-Shirley-Lane Co., Los Angeles, Calif., were low bidders at $1,796,542 when the Bureau of Reclamation opened bids Mar. 1 for completing work on power house and electric switchyard at Hungry Horse Dam, Montana.

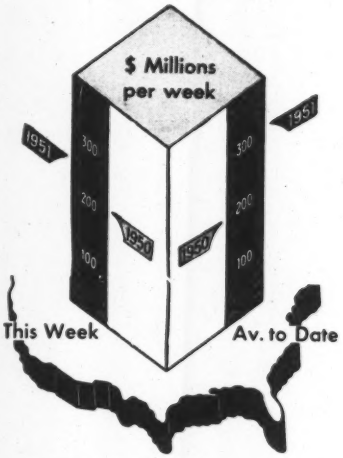
COSTS AND VOLUME

ENR INDEX NUMBERS

Index Base = 100		1913	1926	1949
Constr. Cost.	Mar. '51	537.90	258.57	112.76
Bldg. Cost.	Mar. 51	397.88	215.14	113.13
Volume	Feb. '51	653	265	189

Activity This Week

As reported to ENR (in millions of dollars)



Amount of contracts let

	Week of Mar. 8 '51	Cumulative 10 wks 1951	1950	% chge
Federal	$37.6	$418.3	$358.6	+17
State & Mun.	57.4	676.9	537.3	+26
Total Public	$95.0	$1,095.2	$895.9	+22
Total Private	163.9	2,053.7	1,050.8	+95
U. S. Total	**$258.9**	**$3,148.9**	**$1,945.7**	**+62**

Contracts by type of work

	This Week	Cumulative 10 wks 1951	1950	% chge
Waterworks	$2.6	$37.1	$55.2	−33
Sewerage	5.1	63.3	40.3	+57
Bridges	7.9	56.6	62.4	−9
Highways	22.1	175.9	161.8	+8
Earthwork, Waterways	3.3	52.3	62.9	−17
Buildings:				
Public	39.4	489.7	407.4	+20
Housg., pub.	1.8	136.3	30.0	+354
Housg., priv.	32.8	428.1	588.6	−27
Commercial	16.7	153.2	182.2	−16
Industrial	109.9	1,321.7	187.0	+607
Unclassified	17.3	235.6	167.9	+40

NOTE: Minimum size projects included are: Waterworks and waterway projects, $34,000; other public works, $60,000; industrial buildings, $82,600; other buildings, $300,000.

New capital for construction

	Cumulative 10 wks 1951	1950	% chge
Corporate Securities	$405.9	$398.8	+2
Fed. loans, Priv. Constr.	73.4	0	0
State and Mun.:			
Excl. housing	421.7	303.9	+39
Housing	149.2	160.4	−7
Fed. Aid, non-fed. constr.	0	0	0
Total Non-Federal	$1,050.2	$863.1	+22
FEDERAL	2,602.4	0	0
Total Capital	**$3,652.6**	**$863.1**	**+323**

WRPC presents development study of ten big river basins in third report

Water Resources Policy Commission's Vol. II issues data by River Program and Analysis Committee without comment

The President's Water Resources Policy Commission has issued its third report—a massive Vol. II entitled, "Ten Rivers in America's Future."

Last December the seven-man commission released Vol. I called, "A Water Policy for the American People". Volume III, "Water Resources Law", was issued in mid-February. The commission was established in January 1950. (ENR Feb. 15, p. 24; Dec. 21, 1950, p. 23; and Jan. 12, 1950, p. 29.)

Vol. II is an 801-page study of the development—past, present and future—of 10 major river basins, augmented by charts and maps. However, it is said to contain few new recommendations.

Unlike the two earlier documents, the Ten-Rivers volume is not a report of the commission itself. Instead, it presents without comment ten studies by two task force groups of the commission's Committee on River Program and Analysis.

This committee consisted of about 35 experts borrowed from the Corps of Engineers, Department of the Interior, Department of Agriculture, Federal Power Commission, Public Health Service, Tennessee Valley Authority and Commerce.

Each study was made by a group of 15 to 20 men, with a member of the commission's staff as chairman. Leland Olds, commissioner in charge of studies, coordinated all the staff work.

The more important findings presented for each of the river basins follow.

• **Columbia River**—"Complete integration and coordination should be sought with Canada" to provide new storage capacity that would "afford substantial benefits to existing and potential hydroelectric power projects in the U. S. portion of the basin." Power plants under construction will bring annual output to 80 billion kwhr, but development of 300 other potential power sites could add 87 billion kwhr per year.

• **Central Valley, Calif.**—"Integration and operation of all major power facilities, both federal and non-federal, in a single system is desirable for reasons of national defense as well as regional development, provided the private systems cooperate fully in accomplishing the objective of federal power policy."

• **Missouri Basin**—"Inasmuch as only about 370,000 out of a potential 9.2 million kilowatts of hydroelectric power have been privately developed, it appears that further hydroelectric power facilities are not likely to attract private financing. Development of federally-financed hydroelectric power need not, however, foreclose the market to private enterprise or to state and local bodies."

• **Colorado River**—Future operations at new projects should have a single, publicly-owned power system, rather than the several agencies, public and private, which participate in distribution of Hoover Dam power.

• **Rio Grande**—Investigations under way and new studies are needed for "complete utilization of the limited water resources" of this basin.

• **Connecticut River**—"The coordination of part of the potential power on the Connecticut River and other New England rivers with St. Lawrence power would provide an efficient and mutually advantageous initial step toward the full integration of hydroelectric power in the northeastern region." A federal program for the Connecticut basin should "provide fully for bona fide local participation in the program."

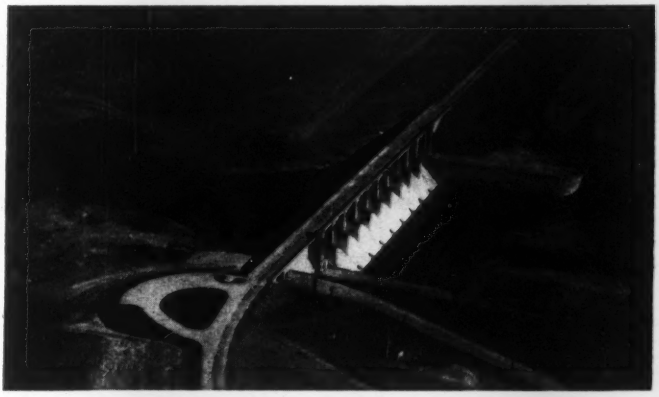
• **Alabama-Coosa Rivers**—"Full utilization of the hydroelectric power potential plants, would add more than the economy of the basin." Present power development totals 492,300 kw, while 24 undeveloped sites plus 31 potential plants, would add more than 2 million kw.

• **Potomac River**—Although some 14 undeveloped projects would have an estimated total capacity of 771,500, kw, "No projects or programs are at present proposed to develop any of the potential water power . . ."

• **Ohio River**—Basin includes federal power projects on the Cumberland, but excludes TVA. "Full economic development and integration of the hydroelectric power resources of the Ohio River should be achieved."

• **Tennessee River**—"Probably the most pervading effect of the Tennessee experience on water resources programs in the U. S. has been demonstration of the desirability—even the fundamental need—for integrated or unified river basin development." TVA's experience shows "the value of having centralized regional responsibility . . ."

Last week, the Edison Electric Institute (representing some 250 utilities companies), through its managing director, H. S. Bennion, scored the first WRPC report of last December as suggesting final government control over water, land and electric power. Bennion noted particularly a disregard for suggestions and recommendations solicited by the President's commission when it began its studies last year.



HULAH ON THE CANEY—Tulsa District, Corps of Engineers, accepted the Hulah Dam on the Caney River near Bartlesville, Okla., (ENR Mar. 23, 1950, p. 139) from the Mittry Brothers Construction Co., Los Angeles. Initial excavation was started in 1946 by the Plains Construction Co., Oklahoma City. Dam is a rolled-earth fill type, 4,728 ft long, exclusive of the spillway, and reaches 97 ft above the stream bed. Spillway has ten 40-ft gates. Construction cost approximates $6½ million. Project is a unit in the reservoir system for the Arkansas River Basin, authorized by the Flood Control Act of 1936. (Delmer L. Curtis photo)

HOUSTON EXPRESSWAY PLAN—Urban expressways planned for Houston, Texas, are shown superimposed upon a photograph of the central business section. City has reserved about 15 miles of rights of way. Construction would cost about $5 million per mile at present prices; access ramps about $3.5 million per mile.

Virginia commission OK's $50,000,000 toll highway

The Old Dominion Turnpike Corporation of Virginia has had its charter authorized by the State Corporation Commission in Richmond, and tentative plans for a $50,000,000 toll highway approved by the State Highway Commission.

The next step, according to John J. Wicker, Jr., president of the Old Dominion Turnpike Corporation, will be surveys of a preferential route for the four-lane tollway.

As conceived, the road would be part of a series of state highways connecting the Great Lakes area with points south, as well as a link in a limited access superhighway from western Pennsylvania.

The route now under consideration would begin near Mt. Airy on the North Carolina border, and move through Carroll, Wythe, and Bland counties.

The highway commission approves the charter of any such corporation as a matter of law. It must determine whether or not the proposed plan would fit in with or be injurious to existing state highways.

The commission has no official connection with the project, but the firm's charter requires commission approval of the engineering, construction and materials used on the road.

The Old Dominion Turnpike Corporation will be non-profit, as well as privately financed.

Although the firm is not ready to talk money for at least 60 days, Wicker says that there is "plenty" of private backing available from bonding houses. Virginia firms, he says, would be given preference in buying the securities.

Need extensive financing for California highways

California highway users would pay considerably higher taxes under bills which have been introduced in the state legislature.

Included in the proposed legislation are bills which would increase the gasoline tax 2¢ a gallon to 6½¢ and boost the state diesel tax from 5 to 7¢.

Senator Randolph Collier of Siskiyou County, chairman of a state senate interim committee on streets, highways and bridges, has introduced legislation to carry out a program designed to raise highway use taxes $100,000,000 a year, including the proposal for an increased gasoline levy.

Collier called for a $1,000,000,000 bond issue to be financed by the gasoline tax increase.

In support of his plan, Senator Collier pointed out that reports of the California department of public works show deficiencies in the highway system are more than twice as great as they were in 1946.

Increases in population and traffic, plus construction and acquisition costs, he declared, have put the highway program behind schedule.

In 1946 the state listed critical deficiencies totaling $1,461,722,000. A department of public works report dated Jan. 1, 1951, places the total at $3,016,937,600. This represents 11,298 miles of highways considered inadequate.

In the next decade, current revenues would yield $140,000,000 a year for the highways. The Collier plan would step this up to $240,000,000 a year and reduce the deficiencies considerably by the end of 10 years.

State road construction seen for municipalities

More than a majority seems assured for passage of a bill requiring the North Carolina State Highway Commission to build and maintain all city streets which are part of the State Highway System (ENR, Dec. 14, p. 29). The new bill has been introduced in the state legislature with signatures of more than half of the Senate.

The bill provides:

(1) That city streets part of the state highway system shall be constructed and kept up by the state.

(2) That $5,000,000 yearly shall be distributed among cities and towns for construction and maintenance of streets which are not a part of the state system. This is in addition to present $2,500,000 now already provided.

The money would be allocated to cities and towns on the following basis:

One third on a population basis; one third on street mileage basis, non-state, and one third on the basis of municipal need.

The measure provides no additional taxes for the additional expense to the state.

Battle forms in Indiana: blacktop vs concrete

Indiana state legislature has under consideration a proposal to invite bids on both blacktop and concrete types of paving for every construction project.

The bill has reopened a battle that has raged since 1941 when the practice of accepting bids on both types of pavement was discontinued.

Advocates of concrete pavement point out that blacktop pavers can underbid them nearly every time. Blacktop pavers contend the present system is "unfair and discriminatory."

Oklahoma improves U. S. 66 at cost of $9,265,000

Along the 356-mile route that constitutes Oklahoma's U. S. 66 some $9,265,000 worth of contracts are in operation, C. A. Stoldt, state highway director, says.

This is the biggest face lifting job ever attempted in Oklahoma on one highway at one time. All the work now in progress is scheduled for completion this year.

For 1951 the program includes $3,970,000 more improvements for the road.

Industry, PHS talk waste treatment

Four task groups of the National Technical Task Committee on Industrial Wastes, which met recently with government officials in Cincinnati, reported that definite progress is being made toward more effective control of wastes that contribute to the pollution of the nation's waterways.

The committee was organized at a meeting in Washington, D. C., last May on the invitation of Dr. Leonard A. Scheele, Surgeon General of the U. S. Public Health Service (ENR May 4, 1950, p 29). The committee, at that time including representatives from 22 industries, drew up a broad outline of an industry-federal government approach to the pollution problem.

Initial tasks agreed upon included (1) assembly of a list of sources of information on processes and practices known for using, treating and controlling industrial wastes, (2) assembly of a list of research projects concerned with treatment and disposal of industrial wastes, and (3) compiling a list of problems that confront a given industrial group and for which there is no satisfactory solution.

The four industrial task groups making reports at the recent Cincinnati meeting represented the food industries, mineral products, chemical processing and general industries.

Harry Gehm, technical director, National Council for Stream Improvement, Inc., of the pulp, paper and paperboard industries, speaking for the task group covering the chemical processing industries, reported progress in making available research and process information dealing with the control and treatment of plant effluents.

His group recommended that the government make fundamental studies on problems common to the industries of this group, such as the thickening and dewatering of hydrous residues obtained in treatment of some wastes.

• **Phenols are difficult**—L. C. Burroughs, Shell Oil Co., New York, reported for the group covering the coal, coke, iron, steel and petroleum industries. "One of the most difficult problems of the by-products coke industry is the disposal of waters containing phenols, cyanides and oily wastes," he said.

To handle phenols, he explained, a large new de-phenolizer has recently been placed in operation and several older units have been modified to increase their efficiency.

Burroughs also said that while an expensive neutralization process is being used to handle steel mill pickle liquor disposal, no universally applicable method has been evolved.

He reported that the American Petroleum Institute hopes to publish later this year, new and greatly expanded editions of manuals on (1) sampling and analytical testings of waste waters and (2) methods and devices for disposal of chemical wastes.

The task committee announced that it will not push for appropriations to provide loans or grants to municipalities for public treatment works, but will confine itself solely to recommendations on the need for basic research in the broad public interest. The committee is being expanded to include other industries.

Flood control resisted by local residents

Confusion over the type of flood control project to be installed near Holland and Brimfield, Mass., has raised fears of local residents who are now organizing to fight a flood control project which they believe will wipe out 85% of the taxable property in the two towns, and all of East Brimfield.

Army Engineer spokesmen in Boston say fears are exaggerated. But selectmen say that a complete picture of the program is yet to be forthcoming. In question is the Thames River flood control project.

According to Chairman Charles Collins of the Holland Board of Selectmen, "Some people say that there is going to be a big dam to develop hydro-electric power. Others say it will be a dry basin. We don't know and we would like to find out."

Residents say that 172 dwellings in Holland and East Brimfield would be affected by the project.

HIDING THE THING—Massive Merritt-Chapman & Scott floating derrick lowers a 200-ton box of reinforced concrete that will serve as the outfall chamber for Nassau County's (N. Y.) sewage treatment works at Bay Park. Chamber is 29 ft high, 15 ft long and 13½ ft wide. Circular intake opening will be connected to end of 12,600-ft, 84-in. reinforced concrete pipe from sewage treatment plant. "Windows" in sides are escape openings for effluent.

N. C. legislature studies pollution abatement bill

An anti-pollution bill designed to meet industry's objections to an earlier measure has been introduced in the North Carolina legislature. The earlier bill, industry claimed, did not define in sufficient detail power of the seven-member State Stream Sanitation Commission to be set up.

The new bill provides that the commission shall develop a series of classifications and standards "for the purpose of classifying each of the waters of the State"; that it shall recognize "that different classifications with different standards may frequently be appropriate for different segments of the same waters"; that before classifying a stream the commission must give notice of its proposed action and call a public hearing, which must be publicized in advance.

Also, that when a classification is set up, a special permit must be obtained from the commission in order to change any existing disposal system, make any new outlet into the waters, increase the waste or change the nature of wastes being discharged. No such permit would be granted without the approval of the State Board of Health.

The commission would be authorized to stop existing stream pollution by special order, but special consideration would have to be allowed in cases where it is held impossible "or for the time being not feasible" to correct the pollution; and special orders could not be issued until after a hearing and the defendants would have the right of appeal to the Superior Court.

Violation of the act would be a misdemeanor and the violator subject to a fine of from $50 to $500—each week of violation a separate offense.

Red Cross survey — In Oakland, Wayne, Washtenaw, St. Claire, Livingston, Lapeer, Lenawee, Macomb, and Monroe counties, Michigan, near Detroit, Red Cross workers are surveying schools and other structures which could be made available for housing and feeding of wartime evacuees.

Standards bureau marks half-century

• The National Bureau of Standards, world authority on practical application of scientific knowledge, marks fifty years of service. Here's a quick picture of what it does and how it does it.

E. E. Halmos Jr.
Managing Editor

IN ITS FIFTY YEARS of existence on a hilltop in Washington, D. C., the National Bureau of Standards has acquired the mellow, easy-going atmosphere of a small university campus.

The illusion is nearly complete—so complete that the men and women who work there habitually refer to their 68-acre place of employment as "the campus."

The title "Doctor" falls easily (and quite correctly) from the tongue in addressing many of the scientists there: the buildings across the hilltop are laid out much as a college campus would be. There are trees and shaded walks, grand staircases, an ancient (by American standards) administration building, typical young college students walking about the grounds. The buildings have names, and are devoted to particular branches of science.

But this is no quiet university campus devoted to improving the minds of a younger generation. This center of learning is harnessed to practical purposes. From it have come some great developments for the good of mankind. On its investigations, for instance, most modern building codes are based. From it, too, have come some sinister things: The first proximity fuse for non-rotating shells; the first successful guided missile, for example.

On the campus are great names in the world of science—headed by one of the world's top physicists, Edward U. Condon, director of the bureau.

• Work grows—not expense—Established March 3, 1901 to be a center for research for government departments, the bureau has grown mightily in works and scope. Almost alone among government agencies, however, it hasn't grown greatly in personnel or expenditures. It's present staff is about 3,300, its current budget is about $8,000,000. But its plant and equipment, originally valued at $110,000 now are thought to be worth $55,000,000. The original staff was 14.

Its 108 scientific and technical divisions and sections cover a vast array of subjects and problems, ranging alphabetically from Applied Mathematics and Atomic Radiation Physics, through Building Technology, Chemistry, Minerals, Metallurgy, to Meteorology and Ordnance Development.

Of special interest to construction is the Building Technology Division, headed by Douglas E. Parsons. Its five sections—structural engineering, fire protection, heating and air conditioning, exterior and interior coverings, codes and specifications—do much that directly affects construction practices. Many building standards and design and construction techniques, many building products and their uses are based on the work of this division.

Other divisions also contribute heavily: Chemistry, which investigates paint, varnish, metals; Mechanics, which deals in accoustics and hydraulics; Mineral Products, which checks on building stone and concreting materials, Metallurgy, which investigates metals and underground corrosion.

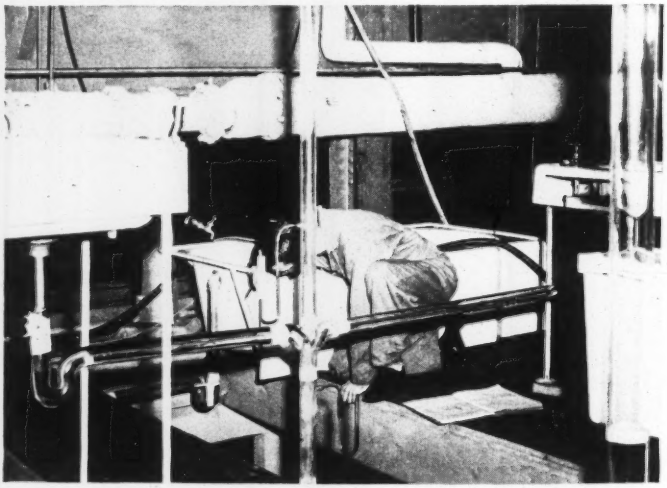
• Variety unlimited—What the bureau does is so varied as to be bewildering to any casual visitor.

In one building an enormous machine, half a block long, is engaged in tension-testing a steel H-beam; in another, chemists are carefully measuring the size and configuration of a particle of cement. In a third a full-sized brick wall is subjected to heat up to 1,700 deg F, then hosed down with cold water; in still another, workmen laboriously coat a perfectly good drainage pipe with a plastic simulating a greasy soap mixture to see how the pipe reacts.

Under the glare of powerful electric arcs, roofing materials are subjected in a week to such extremes of temperature, moisture and humidity as may not occur in nature over a period of 20 years; on that roof, the same materials are patiently exposed (and they may be for 20 years) to nature's own laboratory.

As part of the building end of the bureau's work, samples of concrete are given tensile, compressive and flexure tests, doused in freezing baths, heated to high temperatures, investigated chemically and electro-mechanically, photographed, dissected.

Such diverse problems as plumbing systems for a six-story apartment house, and for a small house-trailer are investigated, full-size, and side by side. In a river model, workers seek to determine why salt water moves far up the Mississippi under one set



WHAT HAPPENS to the venting system when a drain is flushed? Here's one way to find out—a full-size system, with transparent plastic pipes.

of conditions but not nearly so far under other conditions. A man-made lake is used to measure the effect of waves caused by winds over Lake Okeechobee.

A full-size floor section with plaster ceiling, built and loaded as it would be in an apartment house is tested to destruction under high heat in a gas furnace, while scientists watch and measure to see how much it will stand—how safe it will be in a building.

Materials ranging from insulation for refrigerators to insulation for houses give up all their secrets here—there's even an entire bungalow, completely enclosed in a huge box, so that scientists can subject it to any extreme of cold or variations in humidity such as might occur in nature, to see how the insulation or vapor seals works, and where the heat losses occur.

And there's one group of men who do little but set fires—little ones, big ones, oil fires, gasoline fires—then try to put them out. They test fire extinguishers.

• **Ingenuity unlimited**—The complexity of such investigations requires imagination and great skill, not only in the devising of proper tests and reaching conclusions that will be of value, but in making the tests themselves. For many of the tests go far beyond ordinary laboratory routine.

The problem is, of course, to develop within the walls of a building a set of conditions that might occur in nature—but to develop them so that they can be fully and predictably controlled, so that the rain or the sun or the wind or the temperature can be turned on or off at the flick of a finger. And what's more, these conditions must be completely measurable.

For instance:

The problem may concern the durability of exterior coverings (to take one actually under investigation). NBS, manufacturers, government agencies want to know how organic materials such as asphalts, tars, paints, and fabrics will react to conditions of sun and moisture, how much heat they will absorb and how much they will radiate—what makes them break down, what are the best results to be expected.

On what is discovered will rest much of importance to the building industry and the general public.

It would be simple of course, to make up a number of sample roofs and walls, set them out in the weather somewhere, and watch what happens. But that might take years of time—and outside weather is hard to control. The bureau can, and has, made up a series of tests for indoor use—but there have been so many variations in the results over the past years that it is difficult to base conclusions on them.

So, NBS starts from scratch again, builds an entirely new laboratory and entirely new controlled conditions—for example controlling automatically the temperature and purity of the water used within narrow limits to assure uniform operation. In all, it built a room, 16 by 25 ft, maintains it is at a constant temperature of 25 deg C, holds relative humidity to a range of 40 to 60 percent. The room is divided into three parts—a central working space, and two areas enclosed in hoods to house testing machines.

Within one hood are six machines (weatherometers) utilizing enclosed carbon arcs as sources of light (ultra violet). The arcs are enclosed in aluminum drums, 31 in. in diameter, each holding 60 2¾ x 6 in. exposure panels, rotating around the arc at the rate of one revolution per minute.

Air is circulated around the panels at low velocity, until the panels reach a predetermined maximum temperature. Then a high-speed blower goes on, reducing panel temperature. Deionized water, controlled by a cycle clock, can be sprayed on the test panels for any portion of their exposure period.

And that's only part of the equipment. Air conditioners, water conditions, myriad intricate and ingenious panels and controls keep careful check that the test go properly, and on the results.

The results: Doing in a week what nature might take perhaps 20 years to do.

(To correlate the results with actual natural effects, NBS has some 3,000 test panels on the roof of its Industrial Building, where similar samples are tested.)

Want to know how much heat is lost? Build an insulated metal box big enough to take a full-sized roof section. One side of your box is "hot" the other "cool" so that loss of heat can be measured. But building the box, alone, isn't enough. There must be recording equipment that will tell the complete story (for you'll have to run your "box" at night and over weekends when staff may not be present). You must be able automatically to control the conditions inside your box, so that your calculations aren't thrown off by aberrations; you must have people available who can interpret what the machine tells you.

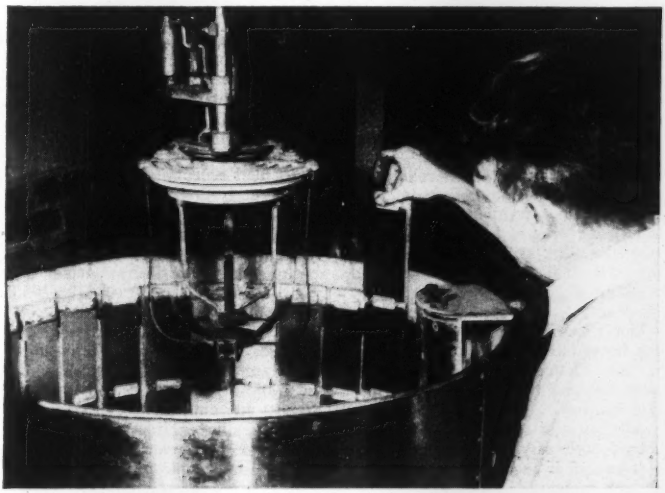
• **And the people**—Here is one of the great assets of the bureau—the people who work there.

When you talk to the people you come back to that campus illusion again. Here are men and women who are proud of what they do, who are convinced of its importance.

They are eager to explain what they are doing, they are endlessly ingenious, they are unbelievably skillful.

They work in an atmosphere of informality, where it is assumed that every man knows his job and every man has been working at it intelligently.

Unusual for a government bureau, there is a minimum of red tape, authority is delegated willingly, there is little or no protocol. A chemist working on metals can consult with an engineer in the minerals division



ROOFING MATERIALS are observed after "torture test". Carbon arc in center generates ultra-violet rays, water-bath simulates rain, as roofing samples whirl around.

by simply walking into his office or picking up a telephone. One division "borrows" workers specially skilled from another without thought of filling out the endless forms that usually accompany such transactions, people consult over lunch.

The policies of the four directors the bureau has had is responsible for this in part; the backgrounds of the people themselves is a larger part. "It takes a special turn of mind," says Douglas Parsons, "for such a job as research. Patience, curiosity, ingenuity are requisites, in addition to a specialist college degree. And when a man has that bent—this is the place for him."

• **How it works**—Although originally set up to do research for government agencies, the bureau actually works both for the government and for private interests—it's principal criteria being that of the public good.

For the government, a project may be initiated something like this:

The Housing and Home Finance Agency, concerned over the diversity of plumbing codes in the United States (there are some 1,500 individual codes), thought a proposed uniform plumbing code would be the answer, if certain comprehensive quantitative data could be obtained.

First step—and NBS encourages such a move—was a direct telephone call by one of HHFA's engineers to H. N. Eaton, chief of the Hydraulics Section of the NBS Mechanics Division.

Had Eaton known the answer (and he knows a lot of them) or had he been able to get it quickly, that would have been the end of the matter. As it happened, he didn't, so there followed a visit to HHFA's offices, general discussion of the problem, decision that a formal investigation would be justified.

At this point, the first formality entered the picture—HHFA's chief wrote to NBS chief Condon, suggesting the investigation and making provision for funds to finance it.

Then HHFA and NBS scientists sat down to formulate their action. Working with them, too, were code-writing authorities, the National Association of Master Plumbers, the United Association of Journeymen and Apprentices of the Plumbing and Pipe-fitting industries; the U. S. Public Health Service.

Basic problem was the serious lack of sound technical data on which to base some of the requirements of a national code. So NBS was asked to investigate three principal points:

The self-siphonage of traps used with such fixtures as lavatories, bathtubs and sinks; the suitability of stack venting of fixtures, and the conditions under which wet venting of fixtures could be satisfactory.

Complete systems were set up — some of them in transparent plastics so that action could be observed—procedures for testing, criteria for judging results were written.

The results—already written into the proposed national code—were specific enough: Stack venting was shown to be satisfactory (and money saving) under certain conditions; it is entirely practicable (with some simple restrictions on the fixtures and sizes of vents) to use wet-venting. As to self-siphonage, the bureau's data should provide impetus toward securing uniformity in the hydraulic characteristics of plumbing fixtures.

• **Private work, too**—Similar investigations — and similar procedures — are often followed for private agencies. But these are always done for groups of manufacturers (there would be no end to it if any individual could call on the bureau at will to test his particular project. The bureau insists on two criteria: The investigation must be in the public interest, and the results must be made public; private interests must contribute to costs.

The bureau itself also initiates projects—basing its decisions on the opinions of the staff as to need and utility, and on its budget as to feasibility.

A partial list of projects now under way includes:

Properties of masonry and masonry units, including weathering and volume change (a bureau-sponsored project); structural properties of reinforced concrete, (bureau sponsored); fire resistive properties of materials and constructions, heat transfer properties of structures (HHFA sponsored); mineral stabilizers for asphalt coatings (sponsored jointly by the bureau and the asphalt roofing industry); development of instrumentation for measuring of strain in the interior of concrete members and masses; and two other bureau-sponsored jobs, one the development of construction standards based on NBS laboratory results and specialized knowledge of safe building construction, the other utilization of the same information in relation to sound and economical construction.

• **Don't lose it**—One of the problems the bureau faces is to keep its information circulating—both within its own staff and to the public that may find use for it.

Within the staff, the problem is solved with easy-going thoroughness.

The staff is encouraged to make informal exchanges of knowledge and information, without regard to "chains of command." Each specialist is required and expected to keep himself constantly advised as to what goes on in his own specialty (through his own research, his contacts as a member of national society committees, through general publications) and to keep contact with men in allied fields within the bureau.

Literally hundreds of technical and semi-technical publications are in constant circulation.

Additionally, the bureau schedules an average of 10 or more lectures each week on widely diverse subjects in many fields. Staffers are expected to attend the lectures (usually conducted by other staff members) that should interest them.

Perhaps the greatest means of passing around information within the staff, however, is contained in the careful and elaborate means of writing and approving reports on progress or results of investigations in progress.

The procedure is roughly this: The "project leader" directing the investigation completes his work (or makes a progress report), and writes out a rough draft of his conclusions and other information he thinks pertinent or useful.

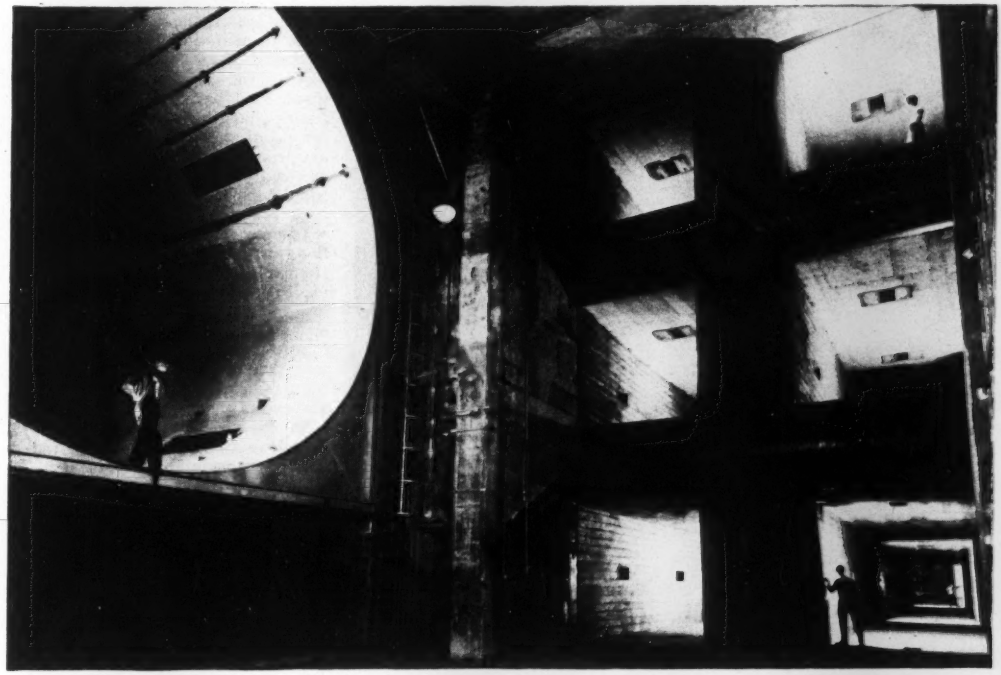
This report is submitted to a divisional "reader" (sometimes the section or division chief) for actual editorial consideration — suggestions for proper emphasis, development of particular points, comments on grammar and the like. Meanwhile, it is also checked by at least two other men in the same section or division, for technical accuracy.

The original writer, having received this comment (and in the process pretty thoroughly informed his own co-workers on his work), rewrites his report, and then submits the document to a bureau editorial committee, staffed in rotation by men from all divisions and sections. This group assigns an "editor", who again reads for accuracy, clarity, usefulness, and who may either accept the report or return it for further clarification.

On final acceptance by this board, the report is then submitted to division heads for approval, and to the office of the bureau's director.

To make the material available now to the public, the Bureau makes use of two monthly periodicals—the NBS JOURNAL OF RESEARCH and the Technical News Bulletin—and several non-periodical series, of which the most important to the building industry are the Building Materials and Structures Reports and circulars.

And, finally, the bureau's own publications department takes care that technical and trade journals, and the general press are advised that the reports have been made and are available (in much simplified form).



SIX BIG RESONATOR-TYPE DUCTS, built onto the modified 26-ft dia diffuser of a supersonic wind tunnel in Cleveland, Ohio, successfully dissipated wind and noise and curbed low-frequency pressure waves generated during "hot" ram-jet engine tests.

Tempest in a tunnel

UNPREDICTABLE pressure waves and combustion noises of such magnitudes as to affect seriously the fundamental research at Lewis Flight Propulsion Laboratory of the National Advisory Committee on Aeronautics at Cleveland, Ohio, have been housed, harnessed and cut down to a whisper.

The solution wasn't easy. It took seven months; required construction of a $450,000 acoustical building addition to the existing supersonic wind tunnel; entailed advanced research exploring acoustical treatment of high-intensity, low-frequency pressure waves.

It started in January, 1950, during a test run on a ram-jet engine under a simulated air speed of "Mach 2" (twice the speed of sound). This test was different. Up to that time ram-jet engines had been tested "cold"; this one was given its shakedown trial while burning propulsion fuel.

The test came off all right, but it created a veritable tempest in the tunnel—tremendous disturbances from two sources. The wind tunnel's 87,000-hp compressor, pumping 2,000,000 cfm, sent shock waves and enormous quantities of turbulent air pounding along the tunnel walls. Added to this were the combustion noises from the burning ram-jet engine in the tunnel test section.

• Shook houses for 2 miles—The noise wasn't so intolerable, but combined with wind velocity it produced pressure waves of high intensity and extremely low frequencies. Not discernible to the human ear, the vibrations shook houses within a two-mile radius.

Public complaint rolled in the next day, whereupon NACA scientists and engineers went on a 24 hr per day, seven day per week schedule until the answer was found.

Ordinarily the supersonic wind tunnel operates an average of 3 hr per day, the year around. Many of the test runs are made at night, when more electric power is available.

First operated in April, 1949, the tunnel was designed on the basis of the best information on acoustics then available. No one recognized or suspected that low-frequency components of noise would cause trouble.

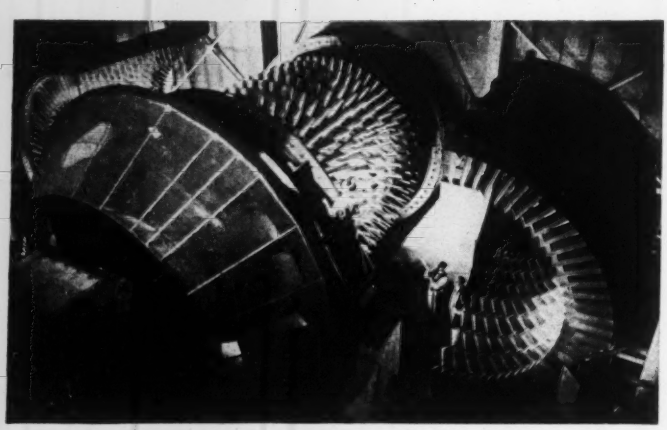
Some NACA engineers, however, soon began to question the ability of the existing facilities to handle "hot tests" effectively. The designers had to wait until the tests were started, then make such modifications and additions to the plant as were necessary.

• Original wind tunnel layout—The original installation included: A huge drying chamber and air-intake tunnel; engine room; compressor; honeycombed air-straightener; the supersonic wind tunnel itself; testing chamber; and a 230-ft trumpet-shaped subsonic diffuser. All facilities but the drying chamber and air-intake are in one straight line.

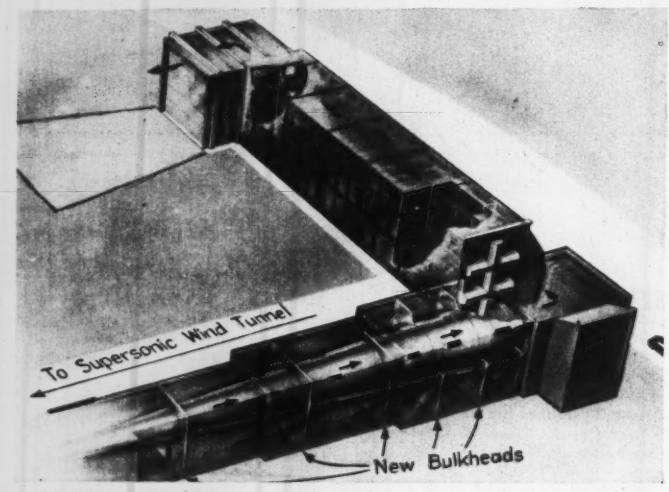
The drying room, equipped with activated alumina drying beds, can extract as much as a ton of water per minute when the compressor is pumping 2,000,000 cfm. Three 29,000-hp electric motors, mounted in tandem, drive the 22-in. dia shaft of the big compressor.

It takes 87,000 shaft horsepower to drive the 18-ft dia, 7-stage axial flow 956-blade compressor, when producing supersonic velocities of 1,500 mph in the test section of the wind tunnel.

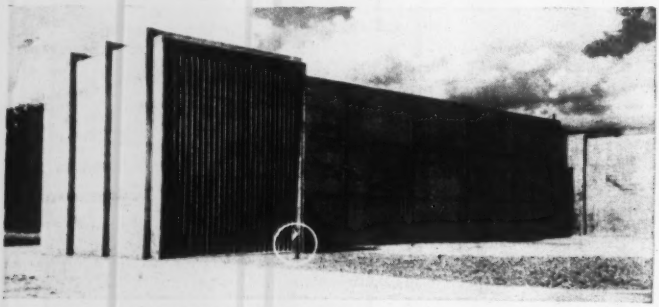
Wind velocities in the tunnel are controlled by varying the shape of the 8x6-ft throat which is made up of 1-in. stainless steel plate walls, floor and ceiling. Hydraulic jacks in horizontal



WIND STARTS HERE—Giant 7-stage compressor produces wind velocities twice that of sound. It mounts 956 blades and requires 87,000 shaft horsepower under full load.



GOES THROUGH HERE—Air rushes through a 230-ft trumpet-shaped subsonic diffuser and bounces against vertical panels of acoustic material. Turning 90-deg, it passes through 150 ft of ducts, dead-ends against an acoustically-treated concrete wall, makes a second 90-deg turn and flows almost silently out between tall acoustic panels.



AND COMES OUT HERE—Dwarfed by comparison, workman gazes into acoustic-paneled exhaust port of 190x50x33-ft acoustical house.

bearing against the walls of the throat move them in and out to get various air-speeds.

After the large volumes of high-speed wind have passed through the testing chamber, the big problem is to get rid of them and still maintain a low-pressure drop to prevent excessive overload on the compressor and electric driving motors.

• **Trumpet-shaped diffuser**—Originally this was accomplished by a 230-ft trumpet-shaped subsonic diffuser made of welded steel plate and housed in a concrete tunnel. It is supported on steel-beam posts, on rocker bearings to allow for expansion. A transition section of tunnel connects the testing chamber to the upstream (8-ft dia) end of the diffuser.

In the original construction, the downstream end of the diffuser (26-ft dia) discharged into a 50-ft high by 30-ft square acoustically treated concrete room. The far wall was faced with acoustic panels of perforated metal and fiber-glass.

Both sides of the room were open, wind from the diffuser tunnel being exhausted through tall acoustic panels extending from floor to ceiling.

This arrangement worked all right until "hot" ram-jet engine tests were attempted. And the trouble caused by the high-intensity low-frequency shock waves couldn't be cured simply by lengthening the diffuser tunnel.

Fortunately, a new method of accurately calculating acoustic resonators had just been developed in the Massachusetts Institute of Technology acoustics laboratory. This greatly simplified the preparation of final design plans. A construction contract was awarded and the acoustical building addition was rushed to completion in four months.

• **Low-frequency pressure waves**—Research and model studies disclosed that the existing 230-ft trumpet-shaped diffuser tunnel could be remodeled to diminish low pressure frequencies in the 5- to 11-cycle range. The acoustical house was designed to handle noise frequencies greater than 11 cycles.

The box-shaped concrete tunnel enclosing the trumpet diffuser was divided into five big resonator-type chambers by the addition of 12-in. thick concrete bulkheads between the diffuser and tunnel walls and ceiling.

• **Slotted resonator chambers**—Slots were then cut in each bulkheaded section of the diffuser. They were of predetermined sizes—based on the average diameter of that portion of the tunnel—to match the air-volume of each chamber. This produced reso-

nator-type chambers that effectively weakened the frequencies for which they were designed.

The original discharge room at the outlet end of the diffuser tunnel was remodeled. The right-hand wall—originally one of the two exhaust outlets—was completely closed off with a reinforced concrete wall.

The far wall, opposite the end of the diffuser tunnel, was filled with staggered panels of 3½-in. thick acoustic panels of perforated metal filled with glass fiber extending from floor to ceiling. All the noise in the air stream from the diffuser tunnel is directed to this maze of panels, making them very effective attenuators in their design frequency bands.

• **New acoustical house added**—The new acoustical house, 50 ft high, 33 ft wide and 190 ft long, was built onto the left-hand wall of the original discharge room. It contains six 10x10-ft resonator-type ducts, in three tiers. The first 63-ft section of these ducts have 6-in. reinforced concrete walls, inside of a 12-in. concrete outer shell and 12-in. concrete dividing walls. Five resonator chambers were formed in the 24-in. air space surrounding each duct.

Slots in the 6-in. concrete duct walls open into each of the resonator chambers which, in turn, are bulkheaded off from the preceding chamber, to complete the pre-determined resonator design.

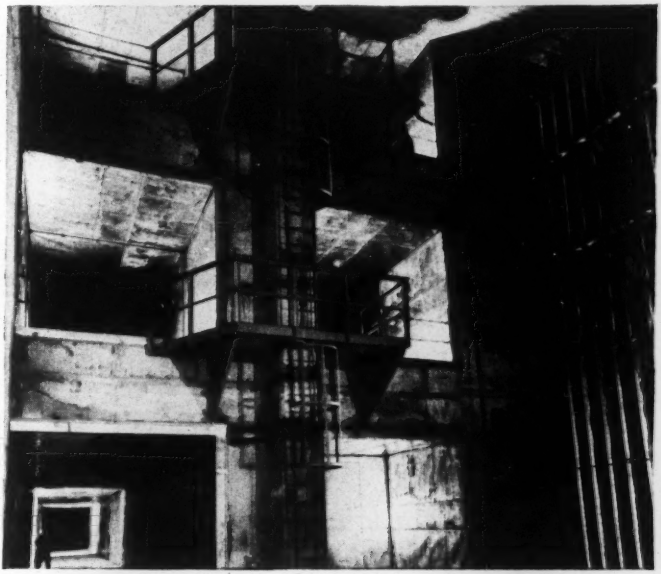
Semi-circular light-gage steel plate fairings formed to a 3-ft radius, placed over the vertical and horizontal concrete dividing walls between ducts, insure a smooth flow of air into ducts.

The second portion of the acoustical house is a 90-ft continuation of the six 10x10-ft ducts. It is similar in cross-section to the resonator section, but the duct walls are made up of 6-in. thick panels of perforated-metal filled with fiber-glass.

These panels are attached to partitioned bulkheads that divide the air chambers surrounding the duct walls. This part of the acoustical house is effective over a range of 20 to 200 cycles per second.

All walls, roofs and liners in the ducts have isolation-breaks, at close intervals, to prevent noise and vibrations traveling down through the structure and thereby by-passing the duct system. The entire facility is designed to withstand operating temperatures up to 300 F.

• **Final exhaust is silent**—Wind and noises from the acoustic ducts empty into a 50x36-ft, by 50-ft high concrete room. They are focused against the far wall. Then they turn 90 deg and flow out between tall acoustical panels.



PERFORATED METAL and fiber-glass panel lining in the air ducts, and tall acoustic panels extending from floor to ceiling of the final exhaust room, absorb sound frequencies above 20 cycles per second.

The end result is that low-frequency pressure waves are completely dissipated and the wind is exhausted silently from the acoustical building.

There is, of course, considerable noise during either hot or cold testing of ram-jet engines under high wind velocities. It is not annoying, however, and is not present in the exhaust from the acoustical building.

The right-hand wall in the final exhaust room is reinforced concrete without acoustical treatment. The far wall, however, opposite the end of the six ducts, was given special treatment to absorb sound frequencies above 200 cycles per second.

Light steel channels were placed vertically inside the concrete wall, extending from floor to ceiling. The entire exposed inner surface then was covered with perforated metal and fiber-glass panels, held in place by studs welded to the inner face of the channels.

• **Other research facilities**—In addition to the $9,500,000 supersonic wind tunnel, the 200-acre laboratory area contains 71 buildings representing a total investment to date of $60,000,000.

Some of the larger research and development facilities include: A 5½-acre engine research building with 100 test cells; a $13,500,000 propulsion sciences laboratory now under construction, to be completed by January, 1952; an altitude wind tunnel which can run full scale engine tests up to 70,000-ft altitude.

One laboratory building is devoted to icing experiments on aircraft and components. There also is a rocket laboratory; a high-energy fuels laboratory; a fractionating tower for making high-energy combustion fuels; a new materials and stresses building; and a new instrument laboratory.

• **Large new tunnel planned**—A second large supersonic wind tunnel 8x8 ft is being planned, with potential wind velocities up to 2,500 mph. Funds for this construction would come from a $75,000,000 appropriation authorized by Congress, for the NACA's three laboratories: at Cleveland; at Langley Field, Va.; and at Moffet Field, Calif.

• **Men in charge**—Robert R. Godman, in charge of supersonic tunnels, was in charge of development and construction of the acoustical building. The construction was done by Hunkin-Conkey Construction Co., Cleveland, under a $450,000 contract.

E. R. Sharp is director of the Lewis Flight Propulsion Laboratory, for the NACA. Abe Silverstein is head of research.

Bolt, Beranek and Newman, of the Massachusetts Institute of Technology acoustics laboratory, were consultants on the original supersonic wind tunnel and on the new acoustical building.

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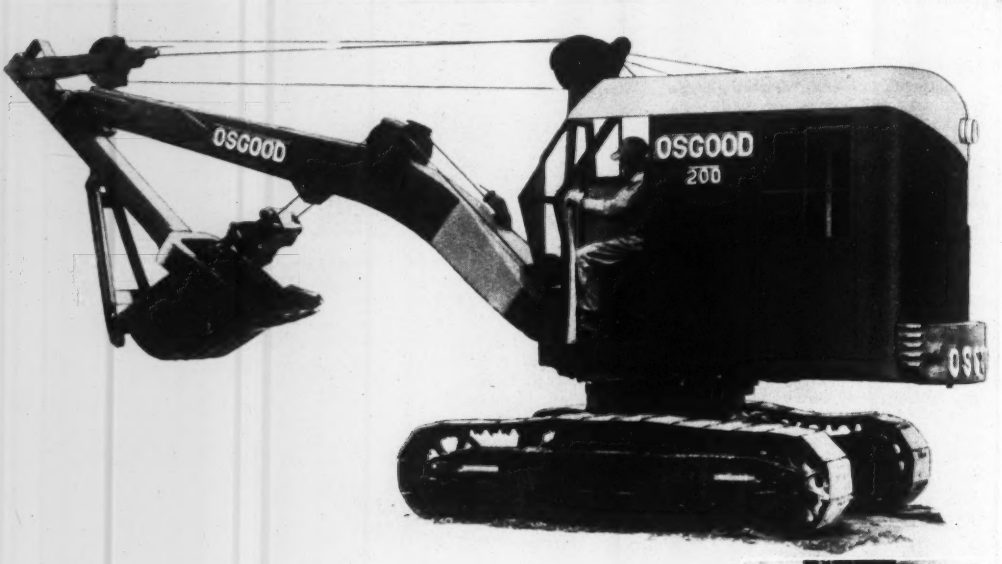

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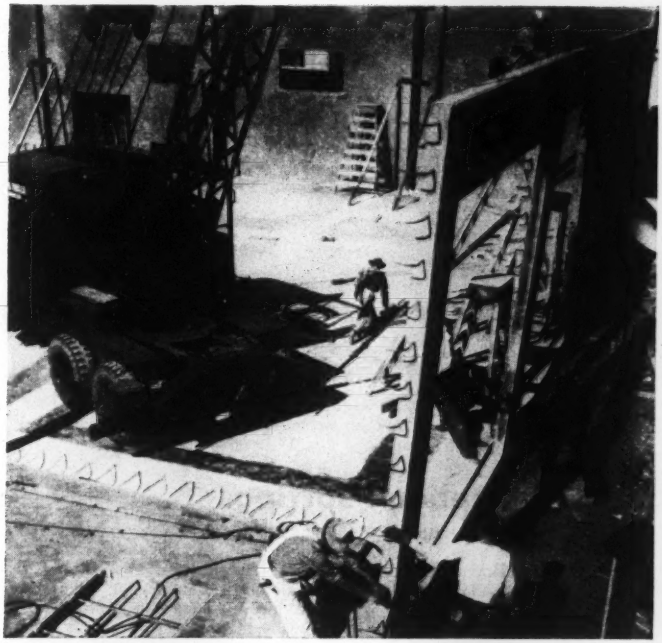


Precasting cuts cost of hospital

PRECAST-CONCRETE wall and roof construction enabled Los Angeles County, Calif., to save a sizable sum of money in building three one-story infirmaries.

The structures are part of sprawling Rancho Los Amigos—largest county-owned chronic and convalescent hospital in the West. Each unit contains a 104-bed ward, 13,800 sq ft of floor.

About 450 precast slabs were erected with a crane—a procedure that made it possible for contractor Buttress & McClellan, of Los Angeles, to bid $600,000 for the job. This was $200,000 under the next lowest bid and about $400,000 under the average of all bids.

Unit construction costs for the infirmaries are $14.50 per sq ft and $1,900 per bed. (Average costs last spring of one-story hospitals under the hospital survey and construction program of the United States Public Health Service were about $15 per sq ft and $10,000 per bed. These hospitals allowed about 650 sq ft per bed, or about five times as much as the new Los Angeles County wards.)

• **Air insulation**—The precast slabs forming the walls and roofs of the new buildings generally are 7¼ or 8 in. thick. Inside is a hollow 3½-in. air space, for insulation.

Typical wall panels are 13 ft wide by 10 ft 2 in. high, and roof units are about 13 ft wide by 15 ft long. Openings were cast in some of the wall slabs for doors and windows. Electrical conduit also was incorporated.

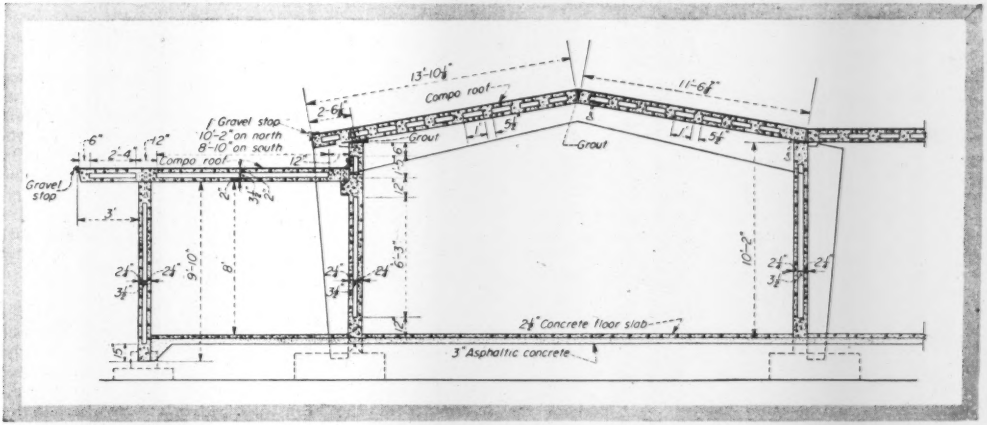
The panels were cast in wood forms on a temporary 2-in. thick concrete casting slab. In forming a typical slab, the contractor placed reinforcing bars in the forms, then poured 2 or 2¼ in. of 2,000-psi concrete. After it had taken its initial set, lightweight cartons were placed on the concrete to form interior air spaces.

Cartons were made of 200 to 275-lb test, corrugated paperboard, about ⅛ in. thick. They were waterproofed with wax.

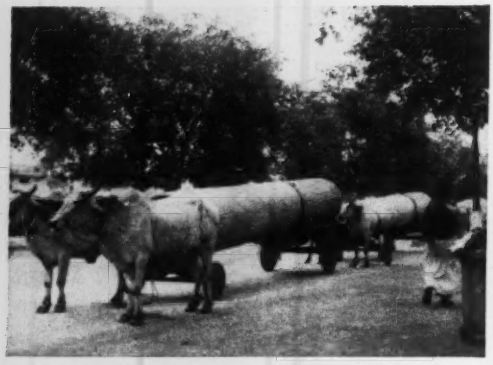
Next, concrete was poured around and over the cartons, reinforcing bars were placed, and finally, the outer face of the panel was cast.

After the wall panels were erected, reinforced concrete rigid frames were formed at about 14-ft intervals to support them. The wall slabs were seated on 8x10x15-in. concrete blocks on the spread footings that carried the rigid frames. Joints between slabs were grouted.

The new buildings were designed by Jack H. MacDonald, architect-engineer, of Los Angeles.



HOLLOW PRECAST-CONCRETE SLABS form walls and roofs of one-story infirmary buildings at Los Angeles County hospital.



CONCRETE PIPE for a construction job in Delhi is hauled through the streets in a leisurely fashion by bullocks.

WOMEN AND CHILDREN as well as men constitute India's construction forces.

Letter from INDIA—Notebook Jottings

W. G. Bowman
Editor

CAIRO, EGYPT, FEB. 6, 1951—No one, least of all an editor and an engineer, can visit a foreign country without coming away with a notebook full of brief reminders of sights, sounds and conversations jotted down for future reference.

Each of the 200 engineers from 30 different countries, who left India last week after attending the conference of the International Commission on Large Dams and the sectional meeting of the World Power Conference, had such a notebook. Probably he looked back through it only after he was settled in his plane seat on his homeward journey, for there was little enough time for such things during the two week's tour of the country by train and bus that was sandwiched between the technical meetings in New Delhi and the concluding session in Mysore 5,000 miles later.

The notebook from which these paragraphs are written received its first going-over on the 14-hour flight from Bombay to Cairo. By the time Farouk Airport (built as Ladd Field by the U. S. Army Engineers—ENR Sept. 23, 1943 p 454) was reached more than enough items to make this piece had been selected. They are being written in this capital city of Egypt, while waiting opportunity to go to Israel—an opportunity which must be self-made by a slight amount of legerdemain since the Arabs and the Israelis are still technically at war, with all of the restrictions on travel that that implies.

Looking back over the Indian visit it seems certain that no other country in the world could or would have assumed the trouble and expense that India did to reveal its thinking and its topography to these foreign delegations of engineers. The reason was apparent in a statement by A. N. Khosla, director of India's Central Water Power and Irrigation Commission, and the chief host to the delegates. Said Mr. Khosla:

"These meetings have put India on the engineering map. They will reveal that she has started dreaming of great things, and is no longer satisfied with hunger and poverty."

India is bidding for sympathetic understanding and help. If courtesy, cordiality, friendliness and frankness can assure such aid, the Indian engineers, who lavished these things on their guests, made a good beginning. At the very least, by the 16-day study tour that penetrated into back country and touched cities and villages, they gave India's problem substance in the minds of the foreign engineers. And frequently they softened its rough edges by some fact or legend about Indian engineering. For example:

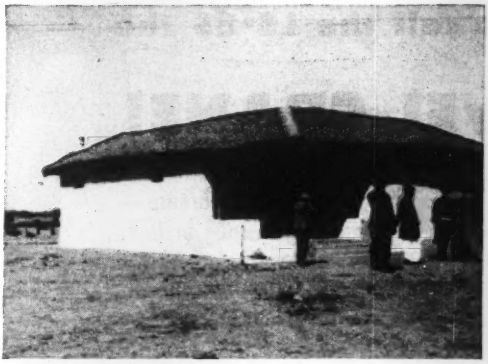
• **Elephant-foot**—Earthfill compaction by flocks of sheep (which is, of course, what the sheepsfoot roller is designed to duplicate) was preceded in India by elephants. When the Upper Ganges Canal was built a hundred years ago, the earth dikes that contain it high above the surrounding plain were built in 9-in. layers, each compacted by the tread of elephants' feet—perhaps the forerunner of the huge pneumatic tires of the present that act as earth compactors. In any event, the dikes of the 100-ft wide canal are still watertight today after carrying a 4-knot current for over a century.

• **Initials**—DDT are famous initials in India where wonders have been accomplished by the powder in cutting down malaria. One malaria specialist (a Johns Hopkins graduate) remarked, "If we had the $2 million that TVA is said to spend each year to cut malaria incidence by a mere 18 cases, we could free a million people from the disease." He can prove his contention since in the area under his charge he has reduced malaria cases from 10 million to 8½ million in the past two years by simple DDT dusting.

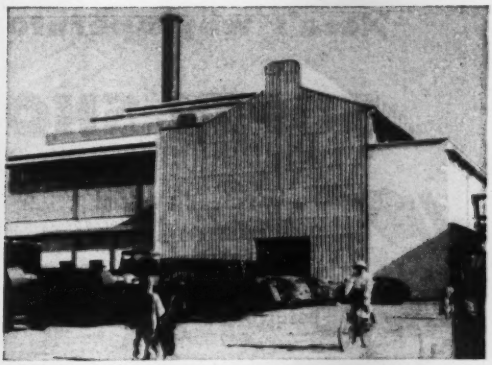
• **Apartments**—Many reinforced concrete apartment houses have been built along Marine Drive in Bombay during the past 5 years. Because of rent control laws, all are of the cooperative-ownership type. Apartments built to rent are not good investments because of the low permissible return.

• **Gates**—Tainter gates 75 ft high are planned for Bhakra Dam. Considerably higher than any in the U. S.—and probably unprecedented anywhere—they will, however, have only a 25 ft span.

• **Pay**—Laborers on Bhakra Dam get the equivalent of 50 cents for an 8-hr day. Truck drivers get $1.50, and the elite is the power shovel operator whose salary is $50 per month. Few construction workers anywhere in India get more than these rates and many are paid less.



MODEL HOMES are being built by the Damoder Valley Corp. for families that must be moved from the reservoir areas.



A MODERN STEAM POWER PLANT of 30,000-kw capacity has just been completed in Madhya Pradesh State.

• **Contractors**—So-called "petty contractors" supply construction labor in India to the general contractors or to the government on force-account jobs. They collect the total payroll, dole it out to the laborers who are as often women and children as men. Most work is on a unit basis—cubic feet of excavation taken out or masonry or concrete put in. Entire families often work together, and if there are small babies they are frequently carried along with the basket of earth or rock.

• **Modeltown**—Jamshedpur, the Pittsburgh of India, is one of the brightest spots on the Indian map. Named for Jamshed Tata, founder of the Tata Iron & Steel Co., it is largely a company town and would compare favorably with Hershey, Pa., in that respect.

But Hershey is not appreciably better than countless other American towns of its size, whiles Jamshedpur is in a class of its own in India. Wide, clean streets, comfortable, attractive housing, modern water supply and sanitation facilities, hospitals, parks, athletic fields and worker clubhouses make it an example to be emulated. But there is no evidence in India that either the government or other industrialists see it that way.

Incidentally, three-quarters of India's one-million tons of steel are made and much of it is fabricated in Jamshedpur in mills that look just like steel mills in the U. S.

• **Grass cutting**—The kans grass job is a blood brother to a construction operation, at least in the kind and size of equipment required.

At first about 200 U. S. war-surplus tractors were used, but these were underpowered for this work and were replaced with some 250 new 150-hp crawlers made possible by a World Bank loan. They push and pull huge root cutters, plows and rakes originally developed by the British for the groundnuts scheme in Africa.

It is the roots of the kans grass—a tangled mass of ½-in. dia shoots that go down as much as 6 ft—that cause the trouble. But by cutting them about 14 in. under the surface, the plant is caused to wither and die in the sun, and the top mass can then be raked and bulldozed aside.

The tractor-drawn cutter consists of a heavy frame, mounting at the rear two horizontal, arrow-shaped knives beveled to make them bite deep into the earth. About one million acres in Central India is being reclaimed by this means. It is deep rich soil that is made available, and when it is plowed—instead of being merely scratched by the ordinary Indian plow—it doubles the wheat yield from 500 to 1,000 lb (17 bu.) per acre. There are nine more million acres of this kans grass land in India that can be reclaimed with the same results, it is estimated.

• **Spillways**—Judging from the number of models at the various hydraulic laboratories and the installation made at Hirebhasgar Dam of the Mahatma Gandhi hydroelectric works in Mysore state, Indian engineers are much taken with the "volute syphon spillway." It is a souped-up version of the "morning-glory spillway," in which each hole is funnel-shaped and equipped with corrugations to impart a spiral motion to the water.

But the real feature is a dome cover that extends down below water level. This creates a seal so that no air pockets are mixed with the water as it flows through the siphon. The efficiency of the device is easily shown in the laboratory by removing the dome. Then only about two-thirds as much water is discharged as when the dome is in place. At Hirebhasgar Dam, 11 of these volute spillways, each 18 ft in diameter, are used.

• **Generating station**—The Mahatma Gandhi generating station is India's latest. Located in Mysore State it takes advantage of the 800 ft drop of the famous Jog Falls in the Sharavathi River. By locating the dam 10 miles above the falls with a power canal to the forebay a head of about 1,000 ft is developed. Four British units are installed and operating, and four of American make are being installed. The total capacity will be 120,000 kw.

• **Fireworks**—A fireworks display at Jog Falls, with burning faggots pushed off of the cliff and skyrockets following the falls downward instead of into the heavens as is normal, was one of the entertainments.

• **Elephant ride**—An earlier entertainment feature in the north of India at the Ganges Canal headworks at Hardwar was an elephant ride for all of the visitors. The lone elephant, with gaily painted head and fancy blankets and howdah, was out of his usual character, for he is normally used for watershed inspection in the neighboring jungle where an occasional tiger is still encountered.

• **Religious requirements**—The diversion dam on the Ganges from which the Upper Ganges Canal takes off does not extend entirely across the river. One channel had to be left clear so that unimpeded water would flow past the holy city of Hardwar. This is a requirement that will have to be met in any dam across this river.

Here's why operators call the LS-85 the

SUPER SHOVEL-CRANE!

- Heavy-duty, all-welded construction..
- Designed to assure short, positive turns in steering
- Wide, long frame for ground-hugging stability
- 13″ ground clearance — nothing to snag or foul..
- Fully convertible for all attachments
- Service and repair parts stocked by your local distributor

5,000 lbs. on the end of a 90 ft. boom! Yet this LS-85 handles the job easily in a plant dismantling operation for Cabot Carbon Co. L. M. Salmon, construction superintendent, is enthusiastic about the LS-85's performance. Foreman Olin Duke says, "The LS-85 must have been built especially for a steel rigger . . . it does everything just right."

FROM its safety type independent rapid boom hoist to its massive crawler base . . . the big, husky LS-85 has what it takes to stand up under heavy digging and lifting operations — year in and year out.

And when it comes to work — the LS-85 asks for it! Quickly convertible, you can use the LS-85 on big or small jobs . . . keep it working, making profits all the time.

The LS-85 Shovel-Crane is the machine with the *speed* for high output, the *stamina* for low upkeep, the *stability* for extraordinary digging and lifting.

12,300

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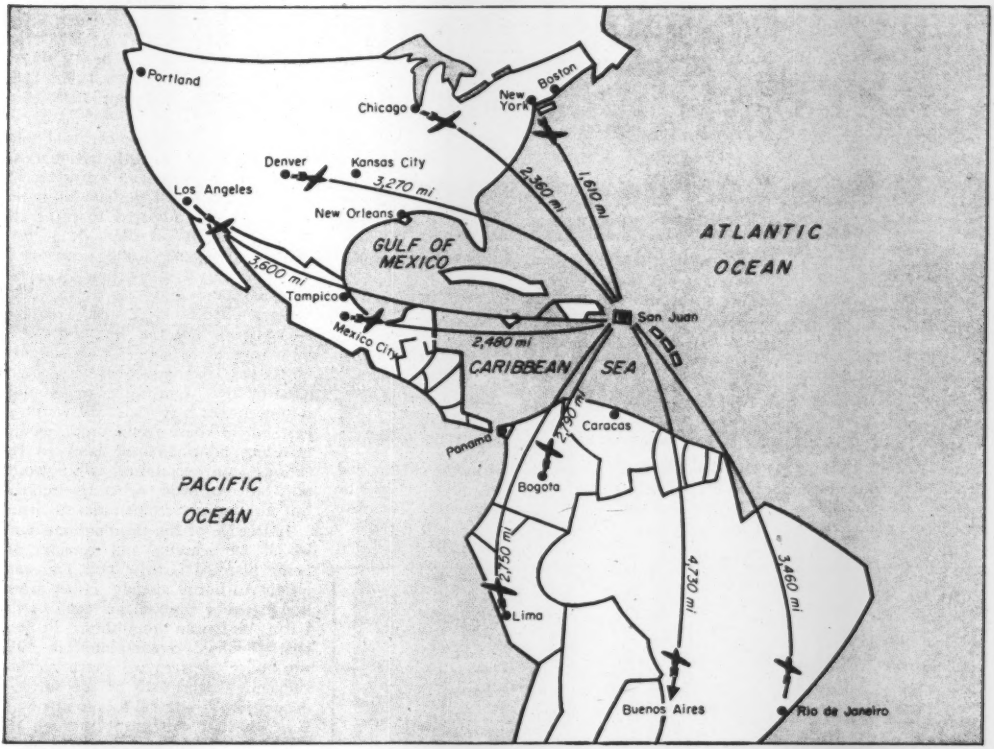


Migrants, tourists, needlework and food already ply the airways as . . .

Puerto Rico builds a lure for air traffic

PUERTO RICO's Isla Verde Airport, high card in a bid for prominence as a hub of air transport in the western hemisphere, is now under construction on the north shore, six miles east of downtown San Juan.

Long-range planning that went into this new federal-aid Caribbean air terminal was coordinated with and influenced by thinking of the insular Economic Development Administration, an agency that is fighting off economic dangers of the island's trend toward over-population by an intensive program of industrialization (ENR Feb. 15, p 32).

The clearing, grubbing, grading and drainage contract for Puerto Rico International Airport (Isla Verde) has just been finished. This was a $1,590,000 contract held by Blythe-Mills Co., of Charlotte, N. C. The pavement contract, estimated at about $1,200,000 has not yet been let at this writing.

Rigid, unreinforced concrete slabs 13 and 11 in. thick will be used for runway, taxiway and service area pavements.

Only one of two planned 7,800-ft. runways will be constructed now. This first runway is due to be completed by the end of next summer; the second strip will follow with a 1953 completion date planned.

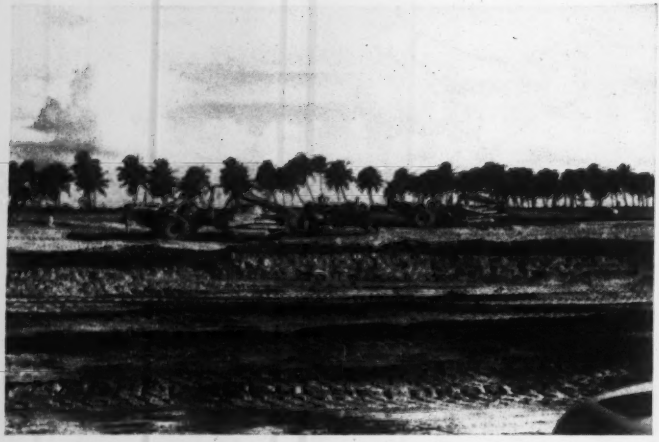
• **Good drainage**—The 1,224-acre airterminal site is ideal for the purpose; good, solid, sandy soil and an ideal setup for drainage.

The economical drainage system designed for the field makes use of long, wide, open ditches, eliminating the need for great lengths of large-diameter drainage pipe, it also provides much of the fill material, cutting down on borrow-haul costs. Relatively short drainage lines, with diameters ranging from 10 to 48 in. lead into these relatively long drainage channels, and water is led off to either of two lagoons bounding the airport area. Drainage ditches have bottom widths as great as 30 ft and side slopes as flat as 1 on 20.

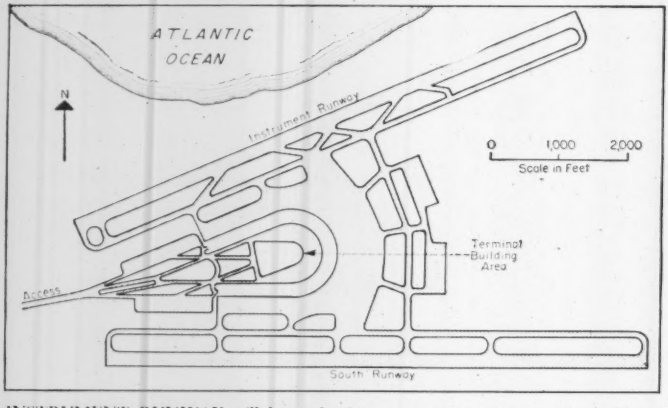
Not all needed soil was cut from the drainage ditches. A borrow area was acquired along the ocean shore 4½-mi east of the airport site. Here sand dunes of good quality material stood as high as 30 ft above sea level and were cut down to a minimum height of 10 ft above sea level in the borrow operation. The contractor had a scraping, elevating loader filling a 21-truck fleet of 13-yard bottom dumps for the haul to the runway site.

Clearing and grubbing meant the uprooting of thousands of coconut palms. These were easily knocked over and pulled out by a crane after a bulldozer had dug a bit around their roots. The trees were shoved off to the side, then hauled to the borrow area where they were buried.

Runway orientation was easy: The trade winds vary little in direction.



PALM TREES AND SAND DUNES took some pushing around in the clearing and grading operations just finished at Isla Verde near San Juan. Now, pavement will be laid and economically more vital flight operations will supplant the less lucrative coconut cultivation that once occupied the site.



INSTRUMENT RUNWAY will be ready this year; south runway is due in '53.

The runway now under construction has its line on an azimuth of about 67 deg (the wind is nearly constantly from the ENE). This is an instrument runway, 200 ft wide, with a 75-ft wide taxiway paralleling it through its entire length. The future runway will have the same dimensions (7,800 by 200 ft) and taxiway, but it will not be an instrument strip, as is this first one. Direction of the future runway will be East-West.

In the area between landing strips will be a horseshoe-shaped paved area, plus all the service facilities. These will include: A 176,000-sq ft passenger terminal, a 24,000 sq ft cargo terminal, maintenance buildings, fire and police stations. There will also be space for parking some 900 cars. At the east end of the service area will be Air National Guard hangars, Civil Air Patrol facilities and accommodations for private flying.

At present, Knappen, Tippetts, Abbett Engineering Co., of New York, is drawing the master plan of terminal facilities, basing their design on an earlier report they did for Puerto Rico's Transportation Authority. The local firm of Toro, Ferrer & Torregrosa, known for their job on the Caribe Hilton, are consulting architects to KTA on the air terminal.

In its report, KTA estimated that air passenger travel through San Juan in 1950 would be 339,000 persons. (N. Y. International passed 394,000; La Guardia, 3,631,000.) They estimate 665,000 for 1960 and 968,000 for 1970. Air mail was estimated at 1,660,000 lbs for 1950; 5,100,000 lbs in 1960; 8,500,000 lbs by 1970. Air cargo: 18,200,000 lbs for 1950, 118,800,000 lbs for 1960 and 240,900,000 lbs for 1970.

The master plan for eventual total development of the International Air Terminal was based on estimates for 1970 traffic; actual designs of buildings are being prepared to meet the traffic demands of 1960. It is estimated that some 1,600 people will be employed at the airport by 1960.

Plans are shaping up in the engineering office of the insular Transportation Authority for development of the fringe areas, along the beach; the north side of the field will be right close by the Atlantic Ocean. A study is now under way that will result in best use of these fringe areas, recommending allotments of land to the various concessionaires, who would not only provide necessary services but also supply recreational facilities.

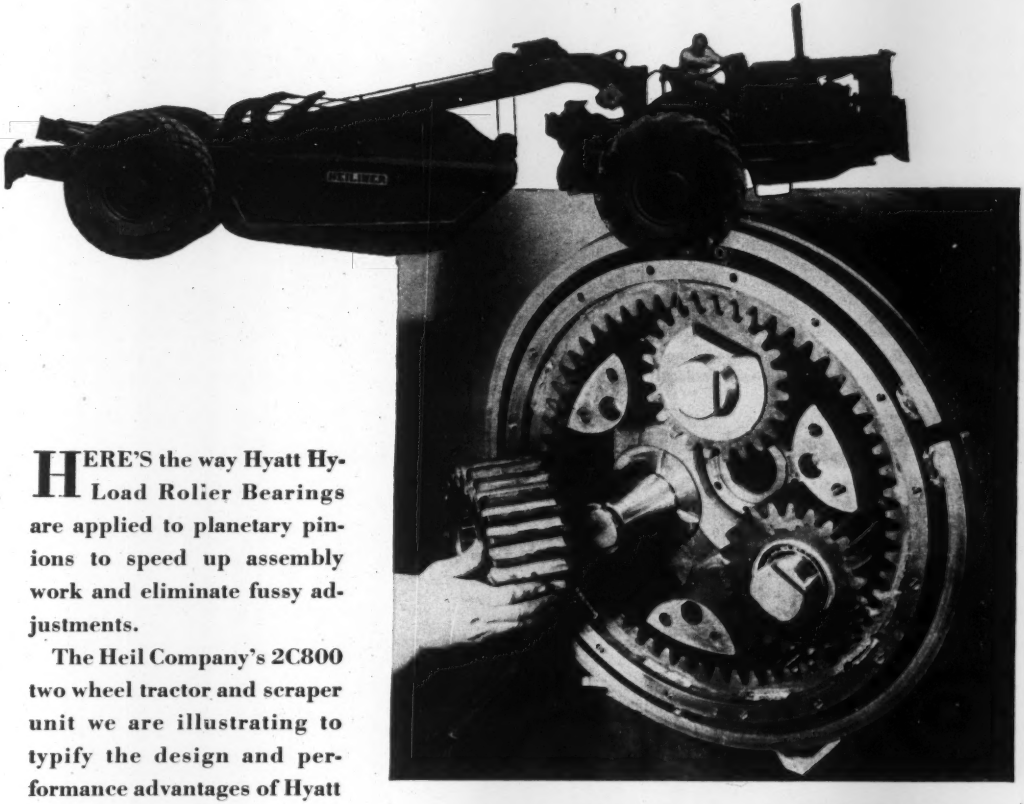
Indicative of the thoroughness with which landscaping and services are being planned is this: The Transportation Authority already has in greenhouses, trees representing each of the Latin American republics. By the time the field is completed in 1953 the collected trees will have reached sufficient maturity to be set out as a decorative tribute to the countries of America that will profit through use of the new, improved air terminal.

• **Old airport**—Existing San Juan airport facilities are makeshift in nature. The Transportation Authority leases Isla Grande Airport from the Navy under a 30-day revocable permit. The field's 5,330-ft east-west runway is inadequate in length—and also it is sinking. Maintenance costs are high; traffic capacity is low.

Originally, the land where the present facilities are situated was leased to Pan American (in 1929) for use in sea plane operations. The field is right on San Juan Harbor, centrally located in the city, but too centrally located for expansion. The U. S. Navy acquired the land just prior to World War II and built the present runway and the taxiways. Present terminal facilities are in an old Navy hangar.

Design of the new airfield was done by the engineering force of the Transportation Authority under direction of Salvadore V. Caro, general manager, and Hernando Guillermety, chief engineer. Eddie Holohan is chief of the authority's Aviation Division (it has also a Bus Division and a Piers and Harbor Division). All construction is being done by contract, and design of the terminal building was given out to the above-mentioned consultants.

Another Example of Improved Design and Performance with HYATTS

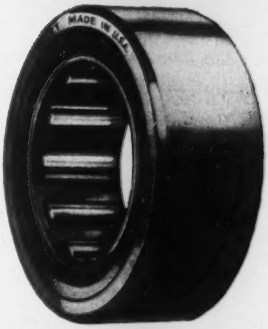


HERE'S the way Hyatt Hy-Load Rolier Bearings are applied to planetary pinions to speed up assembly work and eliminate fussy adjustments.

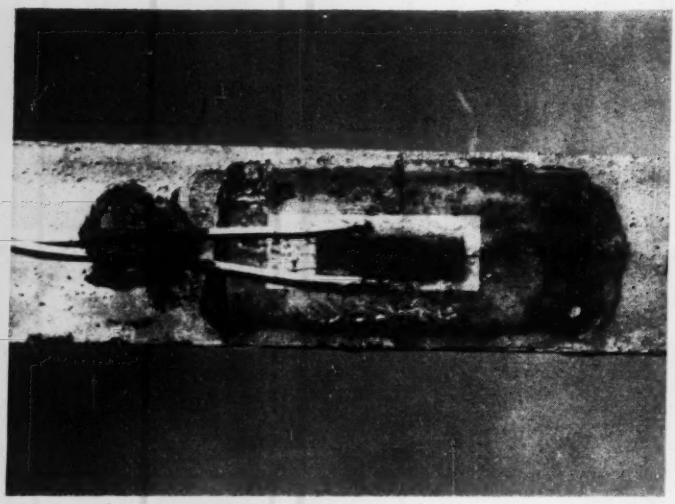
The Heil Company's 2C800 two wheel tractor and scraper unit we are illustrating to typify the design and performance advantages of Hyatt Roller Bearings.

Along with these pinion applications other Hyatt Roller Bearings . . . forty-eight in all . . . are used throughout this entire Heil tractor and scraper unit to insure further construction advantages and dependable, trouble-free operation for the life of the equipment.

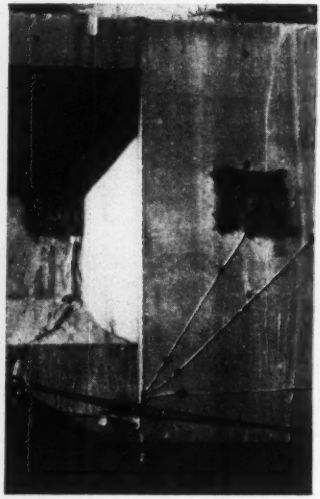
All of which proves that it pays to build Hyatts into the machines you manufacture or look for them in the equipment you buy. Hyatt Bearings Division, General Motors Corporation, Harrison, N. J.



HYATT ROLLER BEARINGS



ELECTRIC STRAIN GAGE bonded to concrete. Celluloid base on the concrete under the gage is the key to the bond problem.



CONCRETE was lacquered around gages on a test prestressed girder.

How to use strain gages on concrete

Arthur R. Anderson
Consulting Engineer
Springdale, Conn.

As AN AID to or check on structural analysis, SR-4—the postage-stamp size electric strain gage—has been used extensively for strain measurements. Difficulties heretofore have hindered application of the gage to measurements in concrete, but these barriers have now been overcome.

Essentially, an SR-4 gage consists of a length of very fine wire arranged in various patterns. This wire is bonded to a paper base or a wafer-thin matrix of plastic-impregnated paper to form the gage.

To measure strains, the gage is cemented firmly to a test specimen, and an electric current is passed through the wire. As the wire undergoes dimensional changes in conformity with strains in the test piece, its electrical resistance varies with the applied strains. Hence, the strains may be obtained from measurements of changes of resistance, which can be made with a simple potentiometer, or with a Wheatstone bridge with a sensitive galvanometer, or with an electronic strain indicator or with an oscillograph.

Principal handicaps to use of SR-4 gages with concrete have been (1) difficulty of bonding gages to concrete; (2) effect of moisture in concrete on leakage resistance between gages and ground, and on shrinkage and creep of concrete with varying moisture content; (3) lack of homogeneity of concrete and (4) paucity of information concerning the stress-strain relationships for the many grades of concrete used in construction.

• How to get bond—The problem of establishing suitable bond has been solved satisfactorily by the following procedure:

First, the surface to which the gage is to be attached is ground to a smooth plane. All dust is removed and the concrete thoroughly dried.

After this, a base for the gage is prepared: A heavy coat of a household cement manufactured by duPont is applied to the concrete. Next, some of the cement is placed on a piece of 0.01-in. thick celluloid, which is then firmly pressed against the treated concrete surface. The celluloid film serves as a plastic shield to force the household cement into the pores of the concrete, thus providing a tenacious bond between concrete and film.

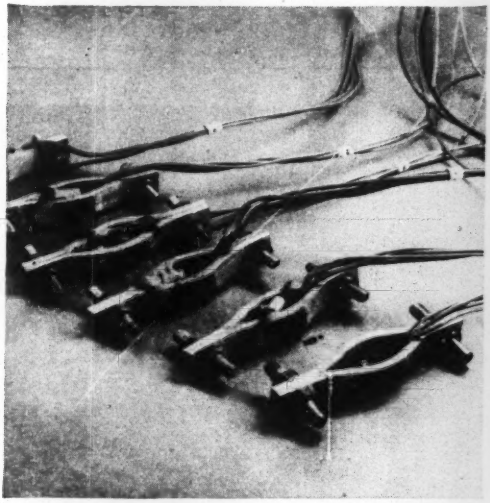
After drying for 24 hours, the film is sandpapered smooth. Finally, an electric strain gage is applied in the usual manner with nitro-cellulose cement.

Wires leading to the gage are attached to the concrete with a patch of Miracle adhesive, a product of the Miracle Adhesive Corp., New York City. This will support their weight and protect the delicate wires in the gage.

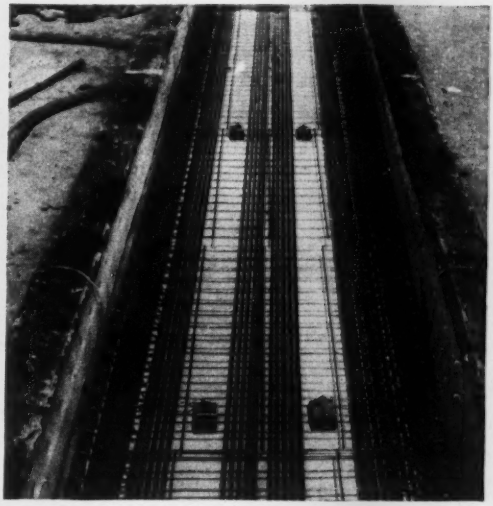
To protect the strain gage from moisture, a liberal coat of hot Petrosene wax is applied over the gage. (Manufactured by General Petroleum Co., this wax may be obtained in small quantities from the SR-4 manufacturers, Baldwin Locomotive Works, Philadelphia 42, Pa.) The further precaution of lacquering a fairly large area of concrete around the gage prevents moisture absorption around and under the gage.

• Prestressed beam tested—The above techniques have been used in several large-scale experiments with concrete structures. The most notable was the testing of a 160-ft prestressed concrete girder for the Walnut Lane Bridge (ENR Nov. 3, 1949, p 18). With 23 strain gages on the surface of this girder, strains in the concrete were measured during the tensioning of 256 prestressing wires and during the subsequent girder loading tests up to and including destruction of the girder.

In evaluating the hundreds of strain readings recorded during the test, a great deal of work was required to get the stress-strain relationship for the concrete. Mid-span deflection and end-slope changes in the girder were recorded for each load incre-



GAGE UNITS, each composed of four strain gages, were encased in small mortar briquettes calibrated and placed in . . .



FORM for a prestressed girder to be tested. The briquettes were embedded in the girder concrete.

ment. Also, the modulus of elasticity of the concrete was determined from measurements of the fundamental frequency of vibration of the girder. This was accomplished by connecting an oscillograph to strain gages on the girder and recording the vibration of the girder produced by men jumping on it. It was possible for a few men to oscillate the span at a fundamental frequency of just over two cycles per second through a deflection of more than 1 in.

Standard concrete test cylinders made of the same mix that went into the girder were tested to obtain stress-strain curves. Two strain gages, one on each side of the test cylinder, indicated strains during compression load tests.

Although noticeable discrepancies in strain were recorded in the individual gages of each cylinder, averages of the two gages plotted as smooth curves. This may mean that considerable eccentricity of loading prevails during standard cylinder compression tests. Thus, the crushing strength of the cylinder appears to be somewhat lower than the true maximum compression strength—a situation that deserves further serious study with the aid of electric strain gages.

Wires in the Walnut Lane girder were stressed after the concrete had reached design strength. Consequently, the gages could be applied to the surface of the concrete prior to the stressing operation. A different situation arose recently in making strain measurements in a prestressed concrete girder for the Concrete Products Corporation of America. The prestressing wires were tensioned prior to casting the concrete.

• **Bonded prestress tested**—In these tests, tension was maintained in the wires during the curing period with jacks. After the concrete reached design strength, the jacks were released, transferring the load to the concrete. Anchorage was thus achieved through bond between wires and concrete. To measure the stress in the concrete when the wires were released, specially designed gage units were placed in the concrete at the time of pouring. These gage units were made by attaching SR-4 gages to curved metallic members.

Four SR-4 gages were used in each unit. Arranged to form a complete strain-gage bridge circuit, they had the advantage of higher sensitivity and of providing temperature compensation within the unit.

Before being embedded in the concrete, each unit was encased in a small briquette of mortar and calibrated. The units, being completely waterproof, were unaffected by the wet concrete, and they performed admirably during the stressing operation and subsequent load tests.

After release of the tension in the wires to the concrete, the girder was removed from the forms and set up for the load tests. Additional electric strain gages were installed on the surface of the girder.

Three test cylinders were cast to obtain stress-strain data when the girder was poured, and on the day of the girder load test, they were tested in the laboratory of Drexel Institute of Technology. Strain data were obtained from strain gages attached on opposite sides of each test cylinder.

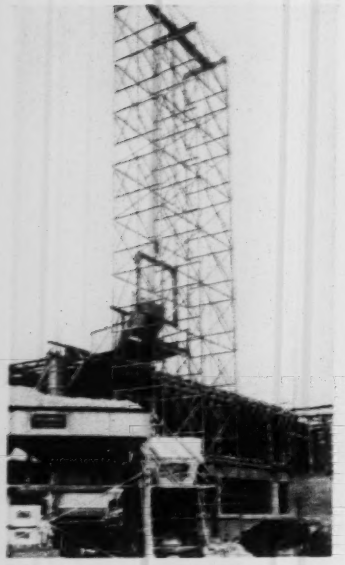
As had been done for the Walnut Lane Bridge test, oscillograph data from strain gages were recorded during vibration of the girder. The elastic modulus of the concrete as determined from the cylinder tests was in close agreement with that obtained from vibration and load-deflection data for the girder.

The two large-scale concrete structural experiments described here, and other projects in concrete research now being conducted by the writer, are convincing evidence that SR-4 strain gages are yielding much wanted data on the behavior of concrete.

Rubber in pavements

Because two of the pages containing the article entitled "What About Rubber in Bituminous Pavements" were interchanged when the Dec. 7 issue was being assembled for printing, reading that article was made particularly difficult. Consequently, it has been separately reprinted with the pages in proper order. Copies can be obtained from The Editor, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

Brief descriptions of the principal test installations of bituminous pavement containing rubber that have been made in this country are given in the article.



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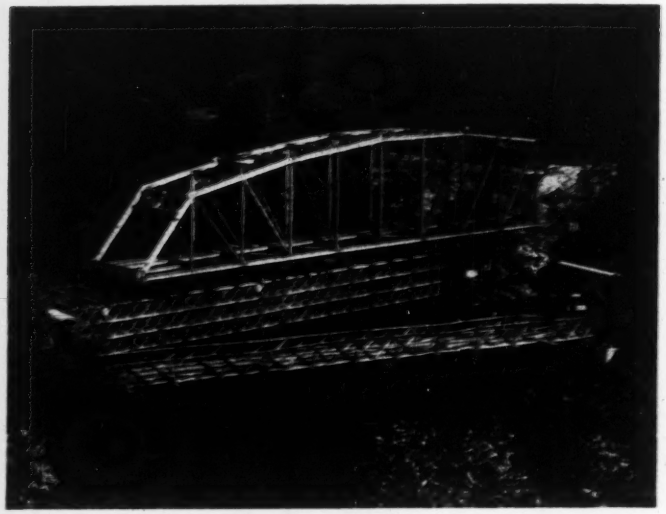


BRIDGE SITE presented many complications, which were overcome as . . .

Bailey bridging speeds difficult erection

Erection of the Anlaw Bridge over the Skeena River, near Hazelton, B. C., presented a problem of considerable magnitude. The site chosen was near an existing 190-ft suspension span of timber frame towers and stiffening truss, with safe loads reduced to 5 tons gross. At this point the Skeena River flows approximately 50 ft deep through a narrow defile with rock walls rising 50 to 60 ft perpendicular from low water line.

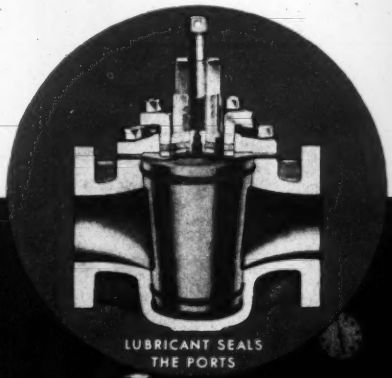
Erection was studied from many angles, it being impossible to erect in the normal manner using a timber pile trestle. The use of a Bailey bridge was considered feasible because: It could be transported across the old suspension bridge in light loads and launched conveniently from the approach fill; and would be 100% salvagable after erection was completed.

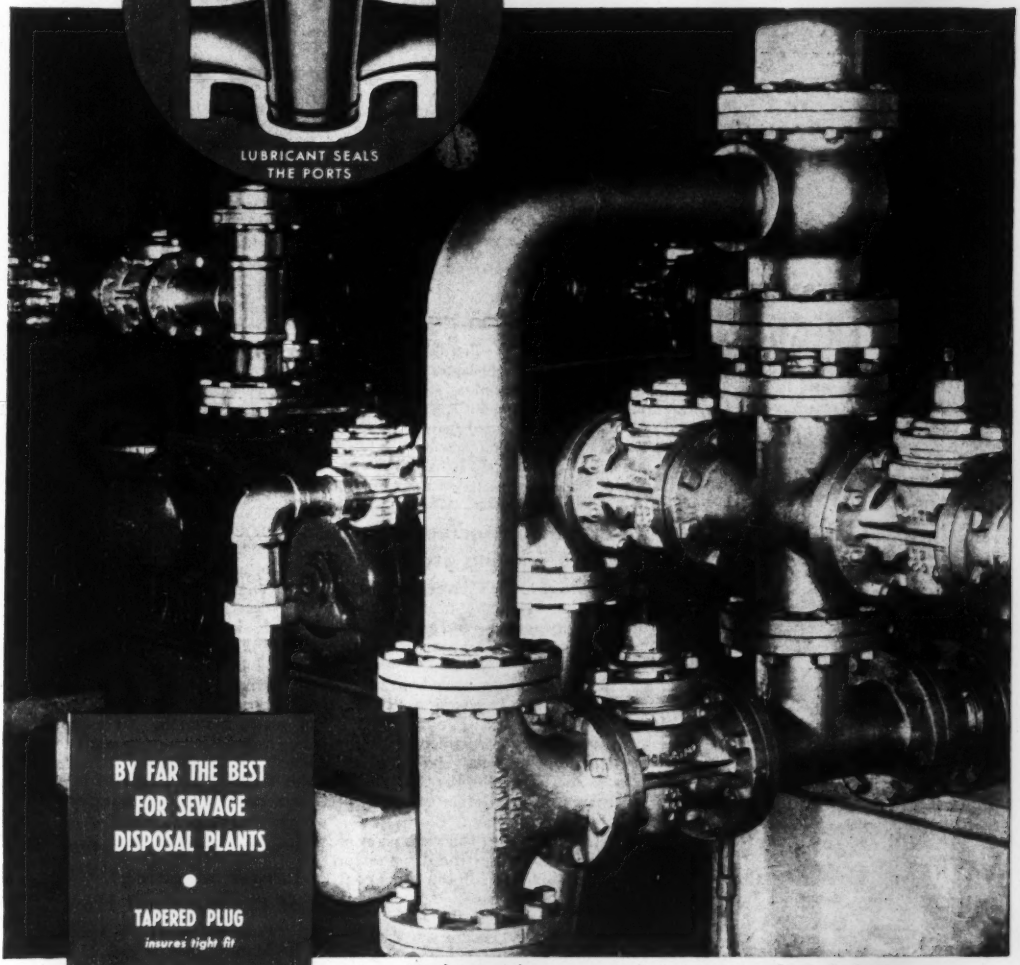
Steel arrived late in March. Abutments were already poured and work completed to allow construction of the Bailey launching noses. The first Bailey was launched on May 23, and left supported, well above high water mark, until after spring run-off. Work on the permanent span was commenced on July 28th with a crew of 12 men using a Dominion 400 crawler placed near the bank, and a 5-ton Clanemobile packing the steel. Erection progressed rapidly and the Baileys provided excellent staging for pinning, bolting, and driving up chord members and floor system. The superstructure was completed September 26—six months after the starting date. Construction was by the Dominion Bridge Co., Ltd., Montreal, Quebec.

Credit and correction—The item on p 51 of the Feb. 8 issue of ENGINEERING NEWS-RECORD, entitled "Careless Dimensioning Fells a Concrete Wall" was prepared for us by JACOB FELD, consulting engineer of New York City. We are indebted to Mr. Feld for this interesting story, and deeply regret that proper credit was not given him as author of the story at its publication.

Many of our readers have written in calling our attention to the obvious discrepancy in the use of vertical lettering for the dimension that caused the trouble, and the use of slanting lettering for the rest of the drawing. This error is entirely the fault of the McGraw-Hill drafting room (careless dimensioning thus fells the Field and Office editor) and should not reflect on Mr. Feld's story. In the original drawing, all of the lettering was vertical, and therefore the error was less obvious than it would seem in our story and drawing.

The valves with TAPERED PLUG for tightest fit





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NO LEAKAGE
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Nordstrom valves on pump lines in sewage disposal plant

Nordstrom
LUBRICATED VALVES

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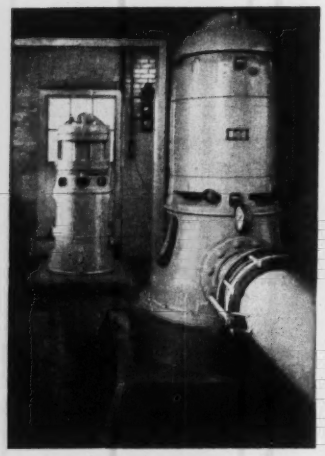

BEATRICE, NEBRASKA

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With a Layne Short Setting Booster Pump

From four Layne Well Water Units, Beatrice, Nebraska was putting 1600 gallons of water per minute into the city through their six miles of 14 inch mains. Growth of population and new industries created a need for more. The problem was easily, quickly and economically solved by installing a Layne Short Setting Booster Pump in line with the wells. As a result, water supply was increased to 2,380 gallons per minute—nearly 41 percent.

The Layne 2-stage, 15 inch bowl booster pump, powered with a 100 H.P. motor was easily accommodated in a small pump house addition, thus saving the cost of extra heating equipment. Installed in 1948, it is giving highly satisfactory service.

These Layne Short Setting booster pumps may be used by other cities—and factories as a means of increasing water supply at a very nominal cost.

If you are in need of more water either from your present wells, or from new units, Layne engineers will gladly survey your present equipment and make dependable recommendations. For further information, catalogs, etc. address

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DEVELOPMENTS ABROAD

RIO ROAD SHOW—Brazil's first major Roads Show (Exposicao Rodviaria) opened Jan. 18 for a 30 to 40-day run. American highway-construction equipment dominates the show in size, location, and total number of units shown. Sited on 1½ acres of reclaimed land jutting out into Rio de Janeiro's Guanabara Bay, the show is open to the general public. It started during the VIII National Highway Congress (Jan. 14 to 21). There are 75 exhibition plots occupied by 30 exhibiting sales agencies or manufacturers' subsidiaries. Sponsorship is handled jointly by the National Highway Department and the Associacao Rodoviaria do Brasil (Brazilian Highway Association).

Re-armament increases Europe's housing problem

Western Europe's critical housing problem has been complicated further by the re-armament program, the Economic Cooperation Administration asserts.

The problem is analyzed in a new special ECA report covering 14 Marshall Plan countries. The crux of the situation is that rearmament calls for construction and enlargement of war plants and this absorbs labor and materials from the home building industry.

At the same time, this expansion of war industries creates the demand for additional housing for the armament workers.

By early 1950, in the nine countries that suffered severe war damage, only half of the 3,500,000 homes that were destroyed had been replaced with permanent housing and only half of the severely damaged housing units had been repaired. Those countries are Austria, Belgium, France, the German Republic, Greece, Italy, The Netherlands, Norway, and the United Kingdom.

Factors which have hindered building have been the postwar scarcity of materials and their high cost, outmoded building methods, and lack of mass production techniques.

Germany, the most heavily damaged of all, has made relatively little progress, ECA says. It was not till last year that a sizable program was started. In most of the countries repair and reconstruction have been stressed ahead of new building, to make the greatest number of accommodations with the least expenditure of scarce materials. An exception is the United Kingdom, where 1,000,000 housing units have been made available thus far, with only 15 percent of them resulting from reconstruction or major repair.

Larger meaning of the Marshall Plan

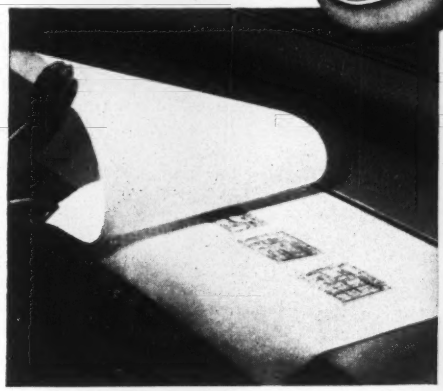
"From the outset, the architects of the Marshall Plan on both sides of the Atlantic agreed that American aid would be meaningful only to the extent that it helpel Europeans to mobilize their own resources of initiative, and of creative energy. In so doing they would renew their faith in themselves and in their fellow men.

"The larger meaning of the Marshall Plan, and the secret of its success, lies in this basic conception.—Lewis Paul Todd, for ECA.

More time for creative drafting!

Look at just two of the ways Kodagraph Autopositive Paper saves valuable drafting time for the Cleveland Crane and Engineering Company.

The chances are you'll be able to take similar short-cuts in your work . . . *turn hours of costly retracing time into hours of creative drafting time.*

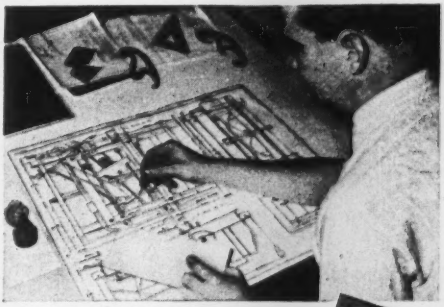


1 Time saved . . . when drawings must be combined

Many clients order custom jobs requiring electrical components which Cleveland Crane must obtain from outside vendors. Oftentimes, the designs for several of these units must be combined in one drawing before original drafting can begin. This used to be a tedious retracing job—*but no longer.* Now, desired sections of the vendors' prints are reproduced as a composite print on "Autopositive" Paper. Exposure is in a direct-process machine; processing is in standard photographic solutions. The result is a sparkling positive intermediate . . . with dense photographic black lines on a clean, evenly translucent base. On it, the draftsman simply adds the necessary wiring detail . . . producing a new "master" in a fraction of the old time.

2 Time saved . . . when drawings must be changed

New design must replace old detail on complicated switch assembly drawings. *And Cleveland Crane is doing the job the easy way:* instead of making a new drawing—which would be 85% retracing—they reproduce the original one on Kodagraph Autopositive Paper. Then the draftsman removes the unwanted lines from the intermediate print with corrector fluid . . . and draws in the new detail. Result: a brand-new "original" is ready in three hours instead of 3 days. *Ready* to produce sharp, legible shop prints in the desired number.



Kodagraph Autopositive Paper

"The Big New Plus" in engineering drawing reproduction

- **It enables you, or your blueprinter, to produce positive photographic intermediates directly at a new, low cost.**
- **It enables you to reclaim old, weak-lined drawings . . . reproduce opaque originals and prints.**
- **It protects your valuable originals . . . produces more legible shop prints.**

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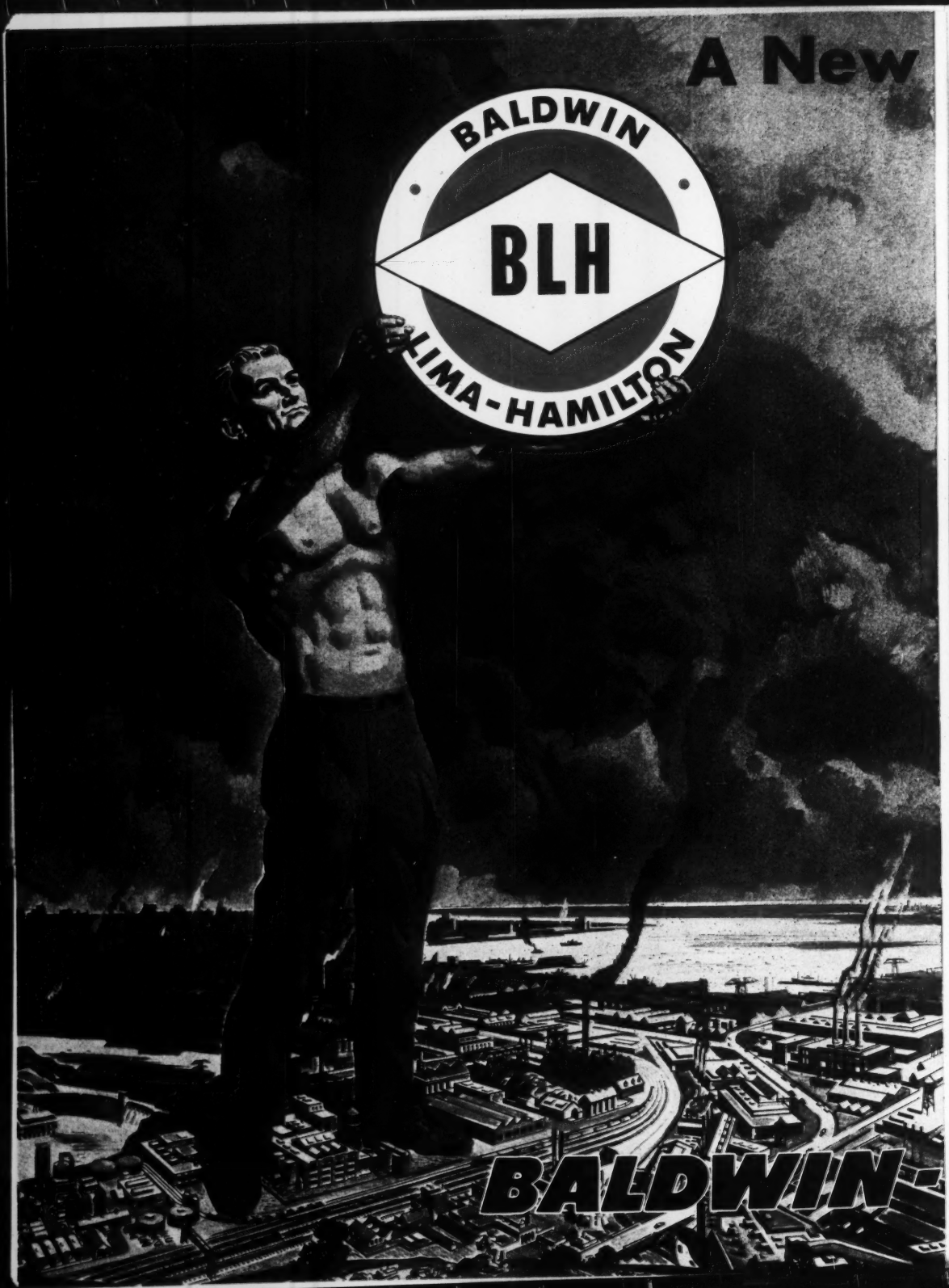
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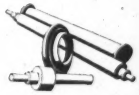
Representing the combined facilities of two of America's leading suppliers of industrial machinery and equipment, this new Baldwin-Lima-Hamilton symbol is backed by many decades of experience, a progressive and continuing research program, and the most modern engineering and manufacturing techniques. It represents the activities of eight plants spotted from coast to coast and numerous established sales outlets, strategically located for prompt, competent service.

The dispersion of B-L-H manufacturing facilities permits "local" handling and delivery on many items to the important producing areas. It also conforms to the projected pattern for better national defense.

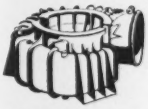
You have undoubtedly used many of the products offered by Baldwin, by Lima-Hamilton and by various subsidiaries, but you may not know, today, how well the Baldwin-Lima-Hamilton Corporation is equipped to supply your needs.

This array of products will suggest added opportunities for you to benefit from the expanded production-distribution-service facilities Baldwin-Lima-Hamilton now offers.

INDUSTRIAL LOCOMOTIVES—Gasoline, Diesel and Diesel-electric powered.



STEEL FORGINGS—Hammered and pressed steel forgings—rolled rings and flanges.



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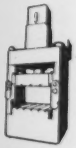
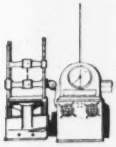
NON-FERROUS CASTINGS—For corrosion resistance. Also special alloys available.

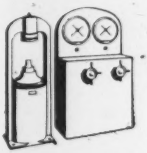


HYDRAULIC PRESSES—All types and capacities. Complete standard line.

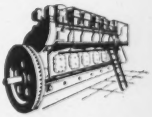


TESTING MACHINES AND INSTRUMENTS—Universal, Fatigue, Stress Analysis.

STRAIN GAGES AND INSTRUMENTS—For an accurate picture of stress distribution.



CONCRETE TESTER—From 90,000 lb. units up to 1,000,000 lbs.



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CRANES—Full range of capacities up to 110 tons, crawler and rubber mounted.

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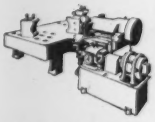

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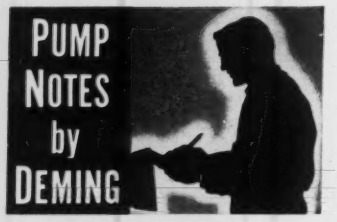
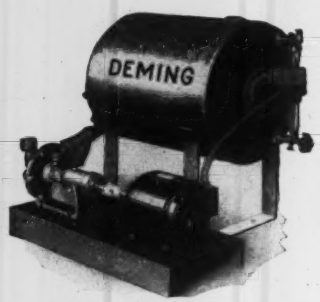


PUMPING CONDENSATE



● Selection of the most efficient condensation return unit for each specific requirement is simplified by reference to Deming Bulletin No. CR-1-B (Copy on request.)

The unit illustrated is one of an extensive line of Deming Condensation Return Units equipped with standard Deming centrifugal pumps, centrifugal jet jumps, "Turbo-Flo" pumps, and reciprocating pumps.

These units are designed to automatically return hot condensate up to about 190° F. from steam coils, radiators, or steam operated equipment back to the boiler. (Boiler pressures up to 100 lbs. p.s.i.)

Dual units are furnished for conditions where occasional peak load demands would be in excess of the capacity rating of a single unit.

"Master Selection Tables" are included in Deming Bulletin No. CR-1-B to assist you in making a selection to meet any combination of conditions. Write for a copy.

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SPECIFY DEMING PUMPS

MUNICIPAL AFFAIRS

DOWNTOWN AREA of Ottawa, showing in center the Parliament Buildings, flanked at left with government buildings, and the Ottawa River in the background. Expansion plans call for decentralization of government buildings, more scenic boulevards, placing industries and railways on outskirts of the city.—Photo Survey Corp.

Canada's capital is being transformed

A plan to beautify Ottawa, Canada's capital city, is now being put into operation. It will decentralize government buildings and have special areas for industrial development. The completion of the master plan may take up to 50 years. Eventually the capital city may spread out over a 900 sq. mi. area.

Currently Ottawa has a population of around 200,000, having increased about 50,000 in the last decade. Much of this increase came during World War II, when government office workers from all over Canada invaded Ottawa. As a result there has been a great expansion of government buildings, office buildings, stores and housing throughout the area.

Building activity in Ottawa is at an all-time high. In 1949 total building permits issued amounted to $10,235,000. In the first half of 1950 they total $12,026,000. Work in the near future will be a new $5,000,000 bridge across the Rideau River and the railway yards, as the first step in the plan to take heavy traffic away from in front of the stately Parliament Buildings, and to remove the railway yards and Union Station to the outskirts of the city. Other construction will be a $5,000,000 government building for the Department of Veterans Affairs, a new government printing plant, and nine school extensions estimated to cost $1,500,000.

Figures for building permits for the full year of 1950 are not yet available, but municipal building under way and now being completed includes a bridge across the Rideau Canal to cost $200,000, sewer extension to cost $400,000, a fire alarm system, water tower and road and street cleaning equipment to add another $460,000 to overall costs. A new municipal administration building to cost $1,500,000 is considered to take the place of the city hall which burned down 20 years ago.

Ottawa 100 years ago was a small frontier lumbering town known as Bytown, with a canal running from the junction of the Gatineau, Ottawa and Rideau Rivers to Lake Ontario, 126 miles southwestward. This was built as a military necessity, but its usefulness has long since disappeared. When Canada became a dominion in 1867 Queen Victoria chose the lumbering town as the new capital, and named it Ottawa after the river. On a high bluff overlooking the wide, rapid-flowing river the Parliament Buildings were built. Since then government buildings, embassies and some factories have been erected along the rivers. A system of driveways along rivers and canals circles the city, and in the master plan these are to be enlarged.

New industrial areas to the east of the city are being prepared. They will

provide for relocation of some existing industries and afford sites for new ones. In neighboring Hull, Que., pulp and paper mills line the river facing Ottawa. Among government buildings to be erected will be a National Institute of the Arts to house the national gallery, a national theater, a national library, a film board building, and an auditorium to seat 10,000 persons. It is also planned to have zoological and botanical gardens four miles from the Parliament Buildings. The entire master plan will revolve around the national war memorial near the Parliament Buildings. The master plan was devised by the French city planner Jacques Greber.

To take care of increased population and a housing boom, Ottawa in 1950 annexed 2,200 acres of neighboring townships.

Municipal Briefs

Jersey City master plan—The planning board of Jersey City, N. J., has released a master plan for the city's future development. Among the recommendations are bus terminals near Journal Square and the Grove St. station of the Hudson and Manhattan R. R. from New York City; and also a cultural center and an industrial development in the uplands on the eastern side of the city.

Auditorium delays—Plans to build a $2,375,000 municipal auditorium at Lincoln, Neb., have been postponed temporarily on account of the National Production Authority ban on construction for amusement purposes, but in any case the bids received exceeded the money available.

Propose big Louisville improvements—A consolidated railroad passenger terminal, relocation of freight yards and freight house, and elimination of 35 of the city's 97 main-line grade crossings are recommended in a report by the Louisville, Ky., Railroad Planning Commission. The report is a final one of the series done for the city by DeLeuw, Cather & Co., Chicago consultants.

City hires engineering firms—Because city engineers at Columbus, Ohio, have their hands full with a $2,000,000 paving program for 1951 which has already been approved, council authorized Service Director Elmer A. Keller to hire private engineering firms to draw plans and specifications for an additional $600,000 worth of resurfacing of 24 streets for 1951. Financing of the city's share is provided for by the issuance of street bonds, to be retired in 10 years from gasoline taxes.

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(Save the tool cost in one operation!)

New—7 Complete Units • 10 to 100 Tons Capacity

SIMPLEX Re-Mo-Trol Hydraulic "Center-Hole" PULLERS

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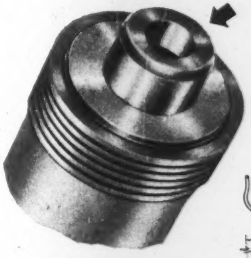
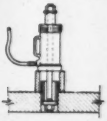


An exclusive Re-Mo-Trol improvement! Ram plunger is tubular. A pull rod or screw inserted through the ram and secured to object being pulled is drawn in a straight line *directly through* the Ram—simplifies rigging and provides its own back-up.



Removing sleeve with Re-Mo-Trol, using supporting cage, pulling screw and back-up washer. Direct pull quickly draws sleeve from cylinder.

* *On Rams of 30-tons or greater capacity.*

DIRECT LINE PULL
No torque or side thrust. Requires up to 75% less effort—lets you do bigger, harder pulling jobs easier.

FEWER FIXTURES NEEDED
Simplifies rigging. The Re-Mo-Trol Ram acts as its own back-up and is self-supporting.

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Operator is always at safe distance. Re-Mo-Trol can be used where lack of space or difficult positioning prevents use of self-contained jacks or pullers.

GREATER UTILITY
Light in weight, easily portable. Operates in any direction—up, down or sideways!

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MEN AND JOBS

Clifford M. Hathaway has resigned as Illinois chief state highway engineer because of ill health, after 38 years of service. He was succeeded Jan. 1 by **Frank N. Barker,** 27 years with the department. Hathaway, a graduate of Brown University, served as a state engineer in Rhode Island before going to Illinois in 1912.

Maj. H. D. Watson has been named executive officer of the Tulsa district office of the Corps of Engineers. He replaced Maj. L. DeNoya, who expects an overseas assignment soon. Maj. Watson is a 1939 graduate of Oklahoma A&M College and was a second lieutenant soon after graduation. He joined the Tulsa district in 1950 for field duty at the Fort Gibson project near Muskogee.

J. Grady Siler, Ashville, N. C., improvments superintendent for the Pisgah National Forest, has retired after 30 years with the United States Forest Service, and has been succeeded by **R. R. Fairfax,** formerly of the division of engineering of the Regional Office of the Forestry Service at Atlanta, Ga.

Frank L. Dieter, city planning engineer at Durham, N. C., for the last six years, has resigned to join the planning department of Westchester County, N. Y. He was planning engineer at Arlington, Va., before going to Durham where he set up and directed the first municipal planning department in North Carolina.

Mark B. Owen, until recently a member of the consulting engineering firm of Russell B. Moore Co., Indianapolis, Ind., has returned to the Nichols Engineering & Research Corp., New York, to be vice-president in charge of that firm's Indianapolis office. The firm is a producer of municipal and industrial furnaces and incinerators. From 1936 to 1943, Mr. Owen was in charge of its research operations, and from 1943 to 1945 he was director of the research and development work of the Committee on Postwar Planning of the American Society of Civil Engineers.

Shelby Edwards, Ashland, Ohio, is now engineer for the village of Loudonville, Ohio.

Col. Wayne S. Moore, recently retired from active duty with the Corps of Engineers. Following graduation from West Point in 1920, Colonel Moore held various posts in the United States and overseas on both military and civil works assignments for the Army Engineers. His last was with the American Battle Monuments Commission at Paris.

Lt. Col. G. O. Billmire has been appointed state engineer of Maryland, succeeding John B. Funk, resigned. He will head the Department of Public Improvements. He has been assistant chief engineer and in the last war was port engineer at Saipan and Tinian in charge of Army ground force construction.

Wm. O. Faylor, president of the Middlecreek Construction Co., Middleburg, Pa., has been elected president of the Associated Pennsylvania Constructors. He started his construction business in Middleburg in 1943, and is a graduate of Rensselaer Polytechnic Institute.

Lee A. Loggins has been appointed chief engineer of the Southern Pacific Lines in Texas and Louisiana. While working for the railroad he earned his way to a Bachelor of Science degree in civil engineering at the University of Texas. In 1948 he became assistant chief engineer.

Lt. Col. Chester L. Landaker has become district engineer at Charleston, S. C. He has been deputy engineer for the Third Army at Fort McPherson, Ga., since August, 1949. He succeeds **Lt. Col. James B. Lampert,** assigned to head a branch office of the Southwestern division at Tulsa, Okla., to prepare plans and study for a comprehensive report on the Arkansas, White and Red River basins.

C. F. Hamlin has resigned as senior bridge engineer with the California Division of highways to become general manager of the Bailey Bridge Equipment Co., specializing in portable bridges for emergency and construction detour service. He will be associated with his father, R. P. Hamlin. They will have headquarters in San Luis Obispo but will operate yards in both San Jose and Oxnard.

Charles R. Waters, Buffalo, N. Y., district engineer for the New York State Department of Public Works, was selected by the "Buffalo Evening News" as one of the 12 outstanding Buffalonians of 1950. The citation read: "As district engineer for the New York State Department of Public Works, Mr. Waters was instrumental during the year in bringing about action for many long-needed state projects to improve Buffalo's physical position, including the Main-Humboldt underpass, High Level Bridge and the widening of Hamburg Turnpike."

Friend H. Lodge, former executive director of the planning and zoning commission of Louisville, Ky., has become planning engineer for the Louisville Chamber of Commerce. He will work on drainage, ground water supply, expressways, grade crossing elimination, traffic, off street parking, parks and recreation, a new produce market, and the new state fairgrounds.

Robert K. Mason has been named field project manager for the Du Pont Co., general contractor on the $260,000,000 H-Bomb project near Aiken, S. C.

George Prudham, Edmonton contractor, has been appointed minister of the Canadian Department of Mines and Technical Surveys. He was president of the National House Builders Association of Canada in 1948-1949. This brings a second representative of the construction industry into the Canadian cabinet. C. D. Howe, Minister of Trade and Commerce, and Deputy Prime Minister, was a consulting engineer.

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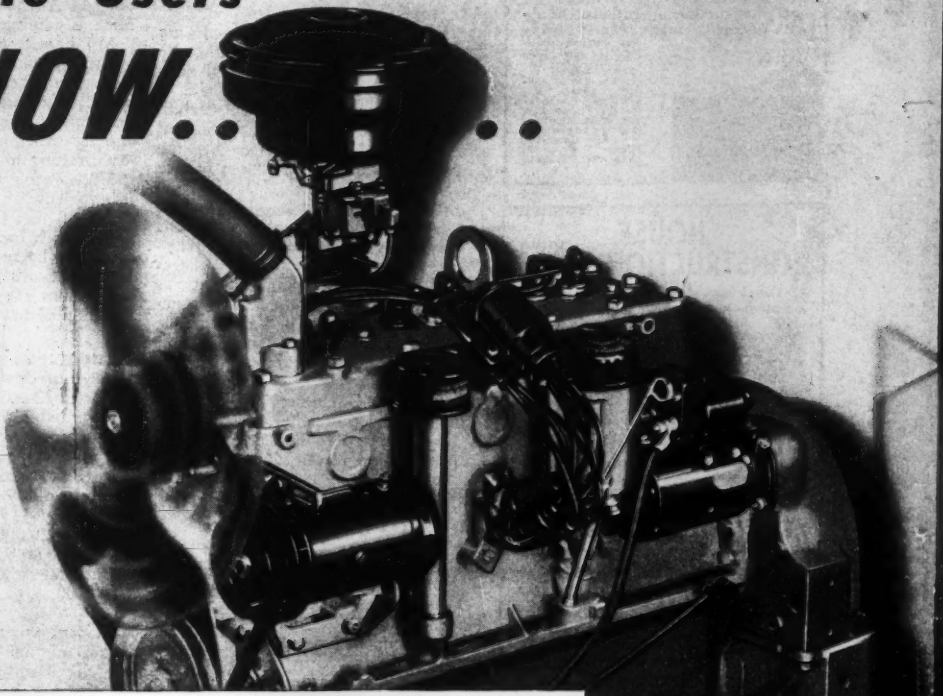

Chrysler Industrial 7—one of eight basic models.

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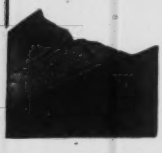
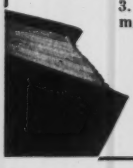


HOUSE CONSTRUCTION COSTS

2. Takes up all phases of building a house—earthwork, masonry, carpentry, plastering, plumbing, etc., telling how to determine unit costs for every operation— a method applicable to designs and local price variations. Includes structural details for many aspects of construction; compares all methods of estimating; covers drilling for wells, installing radiant heating, etc. **By G. Underwood. 302 pages, 63 illus., $4.75**

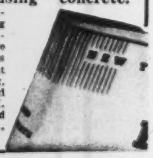
THE BUSINESS of HOME BUILDING

3. Explains business methods that make home building more profitable. Gives a practical understanding of the economic factors determining the market for your product. Covers every important aspect from preparing a project-site, to selling the finished building. **By B. K. Johnstone, Carnegie Inst. of Tech., and C. E. Joern, Wm. Joern and Sons. 289 pages, 174 illus., $4.00**



PLAIN CONCRETE

4. Brings you modern methods in producing and using concrete. Every important phase of concrete technology — preparing specifications, supervising construction, and testing concrete and concrete materials — is fully covered. Includes best practices in proportioning, making, placing, finishing and curing concrete. **By E. E. Bauer, U. of Illinois. 3rd Edition, 441 pages, 166 illus., $5.50**



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EDUCATION and RESEARCH

Eastern colleges to hold science Conference

More than 400 college students are expected to meet at Yale University on April 5-6 for the fifth annual Eastern Colleges Science Conference.

The two-day meeting will feature the presentation of papers on original research being conducted by the students themselves in college science laboratories.

The program will also include speeches by noted scientists as well as exhibitions of undergraduate scientific projects. More than 60 colleges send their outstanding students as delegates. The conference is for undergraduates only. The Yale Scientific Magazine publishes the annual report as well as the outstanding papers presented.

Lawrence C. Horner, 1951, is chairman of the conference. All inquiries should be sent to him at 1116 Yale Station, New Haven, Conn.

Laboratory makes model of Lake Huron harbor

Lake Hydraulics Laboratory of the University of Michigan is building a replica of a portion of the bottom of Lake Huron off Harrisville. An agreement to study the best location for a breakwater has been signed by the Michigan University Engineering Research Institute with the United States Army Corps of Engineers.

The lake bottom is to be reproduced to scale and the action of waves stirred by a machine will be recorded. Model studies will be under the direction of Ernest F. Brater, associate professor of civil engineering.

This work is a continuation of a program of the Michigan State Waterways Commission carried on by the Detroit District, Corps of Engineers.

Experimental research on road construction

An affiliation between the Massachusetts Institute of Technology and the state Department of Public Works has been established whereby they will work jointly on experimental research of highway construction methods and study engineering problems encountered in the field. The state will contribute $30,000 as its share of the cost.

Engineering students of the highway engineering department of M.I.T. will study problems in laying out highways and bridge construction. The students will also follow the projects through to completion.

Prof. John B. Wilbur, head of the highway engineering department, has assigned Associate Prof. Alexander J. Bone as administrator and supervisor.

M.I.T. will set up a special laboratory for experiments on new processes. Resources will also be available to the joint participants for analyzing materials, studying new materials, and also for experimental study of problems relating to projects.

The Boston Central Artery, with its problems of design and construction, will present a subject of study and research for M.I.T. and the state engineers because of the many new ideas that will be tested before the innovations are included in the construction plans.

Educational Notes

Foreign students—Cuba and Colombia, with 22 each are the most largely represented of the 41 foreign countries which have 176 students among the 4,000 undergraduates at Rensselaer Polytechnic Institute. Venezuela is third with 15.

Raises $20,000,000—M.I.T.'s drive for a $20,000,000 development program fund has gone over the top by $100,000.

Canadian engineers—In Canada the annual number of engineering graduates has risen from 400 in 1921 to 3,600 in 1950, but it is estimated that this figure will decline to 1,000 by 1955.

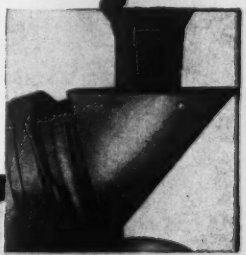
Earnings of scientists—Salary levels of America's top scientists are considerably lower in colleges and universities than in either government or private industry. This is one of the major findings of a study of the employment, education, and earnings of the country's leading scientists. The study, which covers 42,000 of the 52,000 scientists listed in the 1949 edition of the biographical directory "American Men of Science," was made by the U. S. Department of Labor's Bureau of Labor Statistics in cooperation with the Department of Defense. For Ph.D.'s in all specialties the median salary in private industry was $7,070 a year, in government $6,280, and in education $4,860. The engineers had the highest median salary and the biologists the lowest in every type of employment. So important, however, was the difference in salary levels as between one type of employer and another that the biologists working for business firms tended to earn more than the engineers in colleges.

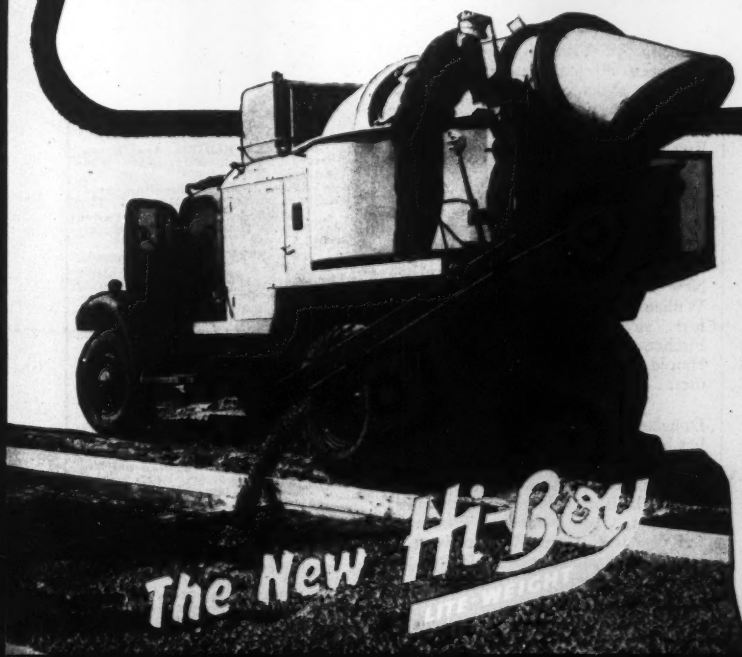
25 PROFIT MAKING FEATURES

The new BLAW-KNOX light-weight Hi-Boy is the only truck mixer which can give you all these advantages:

1. The lightest weight, complete, standard truck mixer.
2. Maintenance-free revolving hopper.
3. Hopper seal guaranteed for one year.
4. Single lever drum control operated from ground or walkway.
5. Single discharge control operated from ground or walkway.
6. Split-second charging through 32" unrestricted opening.
7. Complete end-to-end mixing, even of zero slump concrete.
8. Back-mixing if desired, with hopper in charging position.
9. Convenient visual inspection of batch before discharge.
10. Fast discharge without segregation, even with zero slump concrete.
11. Blade system that discharges entire batch without residue.
12. Fastest and easiest control of discharge.
13. Higher discharge—no confining chutes.
14. Easily replaceable mixing blades.
15. Grout-proof automatic water nozzle, properly located.
16. New silent, automotive transmission—the standard of comparison.
17. All metal clutches running in oil.
18. Finger-tip control for reversing drum rotation.
19. Extreme accessibility for maintenance or repair.
20. Double roller chain drum drive.
21. Clutch controlled V-belt driven water pump.
22. 2-compartment, splash-proof, tilt-proof automatic water measuring tank.
23. 2-compartment flush tank.
24. 3-position, quick-acting, stainless steel water valve.
25. Washout hose included.

Keep your units on the road . . . keep them working!





THE Revolving Hopper assures faster charging, faster discharging. A flick of the latch automatically inverts the hopper for discharge. Another flick and it is upright for charging. The Hi-Boy's exclusive Revolving Hopper ends tail gate trouble by eliminating the tail gate! It is the only rear end hopper with a SEAL GUARANTEED FOR ONE YEAR . . . the only seal that operates safely while submerged in concrete!

Get the "COMPLETE PACKAGE" of ready-mix equipment

You'll like the advantages of getting all your equipment . . . clamshell buckets, batching and charging plants and Hi-Boy Trukmixers . . . all in one shipment, backed by one responsibility, with one source for expert service, and covered by one financial arrangement. Ask your Blaw-Knox distributor to explain every benefit of the "Complete Ready-Mix Package."

BLAW-KNOX

BLAW-KNOX DIVISION OF BLAW-KNOX CO., Farmers Bank Bldg., Pittsburgh 22, Pa.

New York • Chicago • Philadelphia • Birmingham • Washington • San Francisco

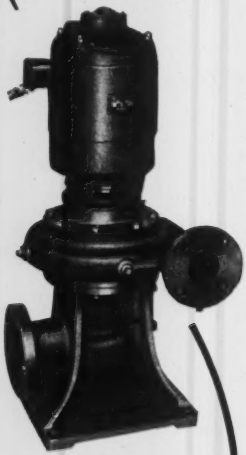
there's no substitute for

WEINMAN PUMP DEPENDABILITY

"Pumps you can DEPEND on"—that's what Engineers say about WEINMAN Centrifugal Pumps.

For instance, the Type "U" Vertical Non-Clogging Pump shown below handles sewage and sludge—in fact, any liquid carrying large solids and foreign material—in a completely dependable manner.

Equally dependable is the advice and service of your WEINMAN representative. He knows pumps and how they can be best applied to your requirements. You incur no obligation when you talk to this CAREER MAN IN PUMPS. Just write, wire or phone.



Type "U" NON-CLOGGING PUMP with squirrel-cage motor. Comes in 3 vertical and 2 horizontal types. Write for Bulletin 7308-1.

Representatives in Principal Cities

Built by Centrifugal Specialists

The WEINMAN Pump Mfg. Co.

296 SPRUCE ST COLUMBUS 8, OHIO

MEETINGS

Officers of the Wisconsin section of the ASCE are: Chas. W. Yoder, president, Carl R. Hollampf, 1st vice-president; Herbert O. Lord, 2d vice-president; and R. E. Boeck, secretary-treasurer.

Moses E. Cox, engineer-director Planning Commission, Atlanta, Ga., has been elected president of the Georgia Section of ASCE. Warren Mann was named resident vice-president; Henry Gray Carter of Savannah was elected non-resident vice-president, and Charles M. Mower, Jr., secretary-treasurer.

John E. Rinne, head of the civil engineering and architectural division for Standard Oil Company of California, San Francisco, has been elected president of the Structural Engineers Association of Northern California for the coming year.

Edward R. Waldo has been elected president of the Billings, Idaho, Engineers Club, succeeding Charles G. Anderson. Other officers: Kenneth L. Chrysler, vice-president, and Leonard H. Dicke, secretary-treasurer.

William M. Trim, Saginaw, Mich., has been elected president of the Southern Michigan Road Commissioners to succeed K. L. Mallenbeck. Other officers include: Vice-president, Roy F. DeHaven, Barry County; and secretary-treasurer, Fred F. Rogers, road commissioner of Livingston County.

Thomas Proctor Eldred, Sr., Utica, has been elected president of the New York State Builders Association. William Bragg, Rochester, was named first vice-president, and William Fischer, Albany, second vice-president. Harold Watson, Niagara Falls, treasurer.

Douglas A. Watkins, Pontiac, Mich., has been elected president of the Oakland County Engineering Society. Other officers: vice-president, Russell Grinnell, Birmingham; second vice-president, George Webber, Huntington Woods; treasurer, Roy Goodspeed, Ferndale; and secretary, James B. Baynes, Pontiac.

The Columbia section of the American Society of Engineers has been organized at Richland, Wash., with two General Electric Co. engineers at the Hanford Works as officers. Francis Torkelson is president and Melvin B. Nelson secretary. The section includes nearly 125 professional engineers in Yakima, Walla Walla, Benton, Columbia, Franklin and Klickitat counties of Washington, and Morrow and Umatilla counties in Oregon.

The western chapter of the Wisconsin Society of Professional Engineers elected Clifford J. Nelson, president, Carl A. Wahlstrom, vice-president, Donald W. Grunditz secretary-treasurer, and Merlin A. Eklund, director of the annual election.

The Manitowoc, Wisc. Master Builders' Association elected Vincent Kerscher, president, Joseph Hoffman, vice-president, Herbert A. Nelson, secretary and Fred Rodant, treasurer.

The Milwaukee Builders' Association elected Harris K. Evans, president; Sidney F. Dwyer, first vice-president; Alfred J. Wetox, 2d vice-president, and Francis Schroedel, secretary-treasurer.

The Ohio Highway and Turnpike Association recently re-elected the following officers: Ernest M. Green, Cleveland, president; A. C. Neff, Middletown, vice-president; Miles E. Evans, Cleveland, treasurer; and Merle Paul, Columbus, secretary.

CALENDAR

American Road Builders Association, Schroeder Hotel, Milwaukee, Wis., March 12-14.

American Railway Engineering Association, Chicago, Ill., March 13-15.

N. J. Sewage and Industrial Wastes Association, Haddon Hall Hotel, Atlantic City, N. J., March 14-16.

Structural Engineering Conference, University of Florida, Gainesville, Fla., March 16-17.

National Housing Policy Conference, Jefferson Hotel, St. Louis, Mo., March 19-20.

Illinois Section, A.W.W.A., LaSalle Hotel, Chicago, Ill., March 28-30.

N. Y. State Association of Highway Engineers, Rochester, N. Y., March 28-30.

New York Section, A.W.W.A., Hotel Ten Eyck, Albany, N. Y., April 5-6.

N. J. Society of Professional Engineers, Haddon Hall, Atlantic City, N. J., April 6-7.

Association of State Planning and Development Agencies, Sherry-Frontenac Hotel, Miami Beach, Fla., April 15-19.

Concrete Reinforcing Steel Institute, annual meeting, The Homestead, Hot Spring, Va., April 16-21.

American Water Works Association, annual conference, Miami, Fla., April 29-May 4.

Materials Handling Exposition and Conference, International Amphitheater, Chicago, Ill., April 30-May 4.

California Section, American Society of Civil Engineers, The Ahwahee, Yosemite National Park, Calif., May 3-5.

Specify Protection in Mobilization Construction

Industrial construction for mobilization will give longer, more dependable service if you specify the *protection* of Monsanto Penta for the lumber you employ.

Monsanto Penta (pentachlorophenol) protects against termites and other wood-boring insects and controls decay caused by fungi. Treated with properly formulated Monsanto Penta, wood can be painted or varnished.

Write for details on *how to specify* penta treatment for lumber . . . for names of companies that can supply material treated with Monsanto Penta . . . for firms able to custom-treat your lumber . . . for brands of formulations with which you can do your own treating effectively. MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1700 South Second Street, St. Louis 4, Missouri.

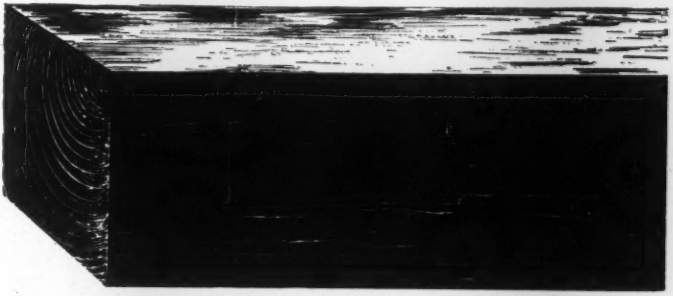
DISTRICT SALES OFFICES: Birmingham, Boston, Charlotte, Chicago, Cincinnati, Cleveland, Detroit, Houston, Los Angeles, New York, Philadelphia, Portland, Ore., San Francisco, Seattle. In Canada, Monsanto (Canada) Ltd., Montreal.

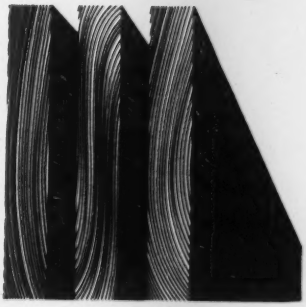
Typical uses of penta-treated wood

Wherever wood is used, penta treatment will give it longer life. The following table gives the amount of 5% penta solution in oil that a cubic foot of wood should retain for maximum protection.

	Humidity average to low	Humidity average high
Sills and plates	6	8
Joists and girders	6	8
Screeds and subflooring	6	8
Factory flooring	6	8
Roof plank	6	8
Platforms and decking	6	8
Posts and fences	6	8
Cooling towers	..	8-10
Sign material	6	8
Millwork	6	8
Highway guardrails	6	8
Railway cars	6	8
Bridge timbers	8	10-12
Utility poles	8	8-10
Crossarms	6	8

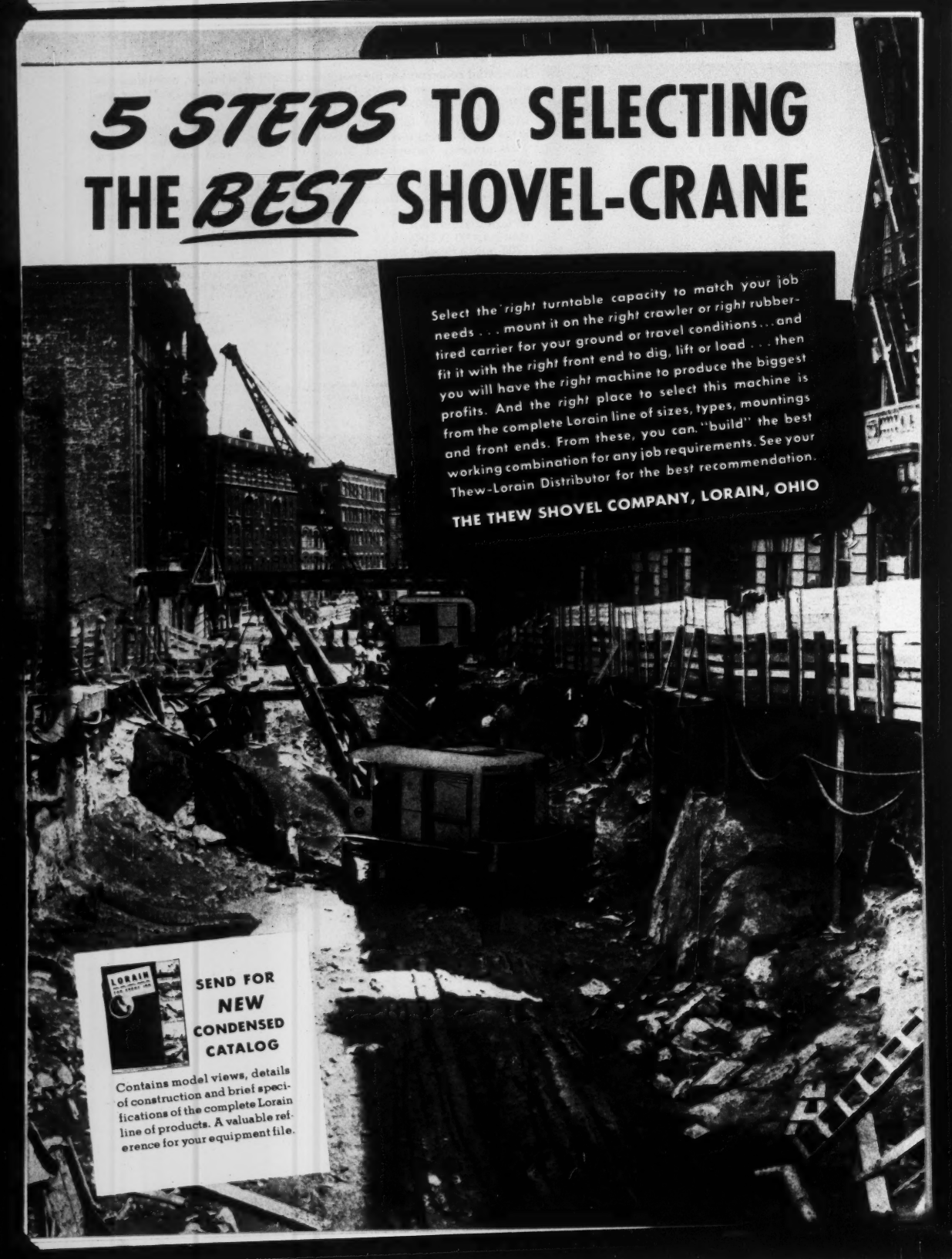
Note: Higher treatments are recommended where wood is to serve under severe conditions, such as in the tropics. Recommendations will be furnished on request.





SERVING INDUSTRY . . . WHICH SERVES MANKIND

5 STEPS TO SELECTING THE *BEST* SHOVEL-CRANE



Select the *right* turntable capacity to match your job needs . . . mount it on the *right* crawler or *right* rubber-tired carrier for your ground or travel conditions . . . and fit it with the *right* front end to dig, lift or load . . . then you will have the *right* machine to produce the biggest profits. And the *right* place to select this machine is from the complete Lorain line of sizes, types, mountings and front ends. From these, you can "build" the best working combination for any job requirements. See your Thew-Lorain Distributor for the best recommendation.

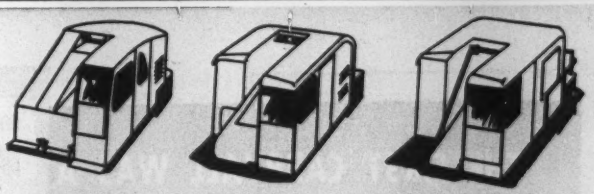
THE THEW SHOVEL COMPANY, LORAIN, OHIO

SEND FOR NEW CONDENSED CATALOG

Contains model views, details of construction and brief specifications of the complete Lorain line of products. A valuable reference for your equipment file.

1 SELECT THE *BEST* CAPACITY TO FIT YOUR JOB...

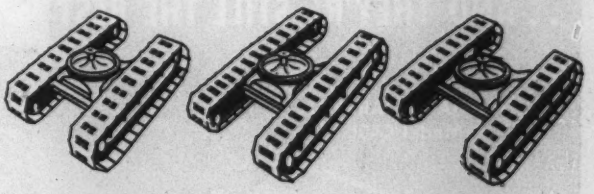
Select from six "Series" of Lorain machines... in ½ to 2-yard classes, including an extensive range of crane capacities up to 45 tons. All Lorains are rated safely and conservatively in accordance with U.S. Government Standards.



TL "SERIES" | 41 and 50 "SERIES" | 79-80-820 "SERIES"

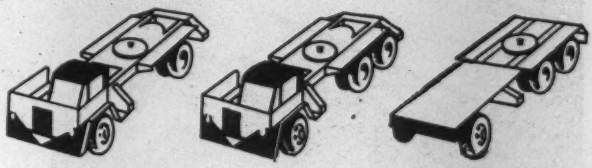
2 SELECT THE *BEST CRAWLER* FOR WORK AND TRAVEL NEEDS...

For crawler jobs, you get more selection in the Lorain line. For shovel or general-purpose-work, select standard lengths...for crane-dragline duty, select extra-long crawlers with greater soft-ground flotation...for trenching or pipelining, select extra-wide crawlers to straddle trenches without cave-ins.



3 SELECT THE *BEST RUBBER-TIRE MOUNTING* FOR MOBILITY...

For greatest mobility, choose from the *world's greatest selection* on rubber. Two-engine Moto-Cranes in 2 or 3 axle types, 4 or 6-wheel drives—speeds up to 33 mph—in 10, 15, 20, 25, 35 and 45 ton capacities. Single-engine Self-Propelled machines in 2 or 3 axle types—2 and 4-wheel drives—speeds up to 8 mph.



4 SELECT THE *BEST FRONT END* TO DIG, LIFT OR LOAD...

Then equip your Lorain with one of five interchangeable front ends... shovel, crane, dragline, clamshell or hoe...and you're in business for profits. Interchangeable booms prepare you for any and all kinds of jobs, present and future.

5 SELECT THE *BEST*, BE SURE IT'S A LORAIN!

Lorains move more material, faster, at lower costs—because of the advanced design features you would expect from our 51 years of experience... plus quality manufacture that has kept many Lorains on the job for 20 to 30 years...all backed by your Thew-Lorain Distributor... always nearby to keep your Lorain producing profits.

THE LORAIN®

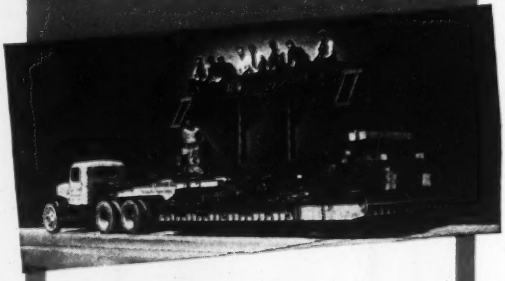
SHOVELS • CRANE • DRAGLINE • HOES • CLAMSHELLS • MOTO-CRANES

THE *FIRST* CARRYALL WAS A FRUEHAUF CARRYALL!

. . AND THEY'RE STILL THE BEST

FRUEHAUF CARRYALL
Model C40L

BUILT TO CARRY *YOUR* LOADS . . . CAPACITIES TO 74 TONS!



YES, the first Carryall was a Fruehauf, built to specifications for a particular hauling job. Today, there are *seventeen standard* models and a host of "specials", designed to fit the requirements of most heavy-equipment users.

Ever mindful of the changing needs in heavy equipment hauling, and always keeping ahead in Trailer engineering and design, Fruehauf is ready to supply you with a modern Carryall to fit your particular hauling job — with either a "standard" or a "special".

For complete information, blueprints or specifications on the Fruehauf Carryall for *your* job, write —

World's Largest Builders of Truck-Trailers

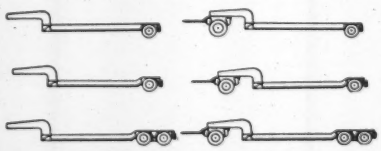
FRUEHAUF TRAILER COMPANY

DETROIT 32 • LOS ANGELES 58

IN CANADA: WESTON, ONTARIO

Fruehauf Carryalls are available in capacities from 10 to 74 tons in the standard models . . . to 150 tons in "specials". Frame designs as single- or double-drop "Semi" or full Trailers. No matter what your hauling problem may be, there's a Fruehauf Carryall to fit your job.

DESIGNED TO *YOUR* SPECIFICATIONS



FRUEHAUF Trailers

ENGINEERED TRANSPORTATION

WORLD'S LARGEST BUILDERS OF TRUCK-TRAILERS

OBITUARY

Ralph E. Campbell, chief civil engineer with the engineering office of Clyde C. Kennedy, San Francisco, died Feb. 6. He had been with the Kennedy firm since 1924, following work as assistant chief engineer on oil development in Colombia and in the Army Engineers in World War 1. He was a graduate of the University of California and an associate member of the American Society of Civil Engineers.

George E. Frobenius, 75, Indianapolis, Ind., a retired draftsman, credited with drafting the first highway atlas in the United States, died Feb. 12.

Paul Coddington, 58, president of the Lakeside Bridge & Steel Co. of Milwaukee, Wis., since 1930, died Feb. 10. He was a civil engineering graduate of the University of Wisconsin.

William Gramling, 79, first city manager of Brunswick, Ga., died there, Feb. 13. For 30 years he was official surveyor of Glynn County, Ga.

Robert W. Culwell, 52, for 21 years a civil engineer with the Nebraska highway department, died in Clinton, Iowa, on Feb. 18.

William R. Matthews, 76, whose contracting company erected most of the buildings on the Princeton University campus built during the last 50 years, died at Princeton, N. J., Feb. 21. Educated in public and trade schools in Philadelphia, Pa., he went to Princeton shortly after the turn of the century. He was with the Stacy Reeves Co. of Philadelphia, and the Thompson-Starrett Co., of New York, and then in 1902 he established his own company. In 1928 Princeton conferred on him the honorary degree of M.S. in Engineering.

Lehr E. Welker, 59, Akron, Ohio, engineer and architect, died Feb. 10. He was an engineering graduate of Ohio Northern University, Ada.

William H. Holl, 84, former city street commissioner of Indianapolis, Ind., and for many years chief inspector of streets, died in Indianapolis Feb. 12. Formerly he was in charge of track construction for the Indianapolis Street Railways Co.

Walter R. Aldrich, 65, of W. R. Aldrich & Co., general contracting firm, Baton Rouge, La., died there Feb. 13.

Raymond A. Kirby, 50, former executive director of the Toledo, Ohio, metropolitan housing authority, died in that city Feb. 4. A graduate of Albion College, Mich., he was long prominent in public housing work. In 1937 he joined the Public Works Housing Division and later went with the Federal Housing Authority.

Sidney A. Anger, 49, Lansing, Mich., traffic engineer since 1936, died Feb. 12. He had served for 14 years as assistant to the maintenance engineer in the state highway department. In traffic matters he was widely consulted by other cities.

Murray C. Street, 67, contractor, Syracuse, N. Y., died there Feb. 20. He was president of the Street Bros. Construction Co. and had been in the contracting business for nearly half a century. With his brothers, George and Harry, he started his own business in 1923. The firm handled a number of major projects in the Syracuse area.

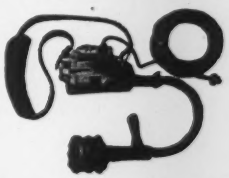
M. Allan Wilson, 41, chief engineer of the Delaware State Highway Department, died on Feb. 23 at his home in Dover, Del. He had been with the department since 1932. He was appointed chief engineer on Dec. 29, 1949, succeeding Col. William A. McWilliams, and last July he was named head of the Civil Defense Highway Division in the state defense organization. Mr. Wilson was a graduate of the University of Delaware with a B. S. degree in civil engineering in 1932, and from the Soils School of the Public Roads Administration in 1939.

George F. Vollmer, retired civil engineer, who was on the head office staff of the Welland Canal, died Feb. 21 in St. Catherines, Ont. He was educated at Owens College, Manchester University. In 1919 he joined the construction division of the Welland Canal in Ontario, and worked on the structural engineering and design phases of the waterway until his retirement.

William H. Spirz, 48, civil engineer with the California highway department bridge division, died Feb. 16 in San Francisco. He was a graduate of the University of California and was one of the engineers associated in the construction of the San Francisco-Oakland Bay Bridge.

Albert A. Coddington, 63, president of The Coddington Co. of San Francisco, died recently in San Anselmo, Calif. His consulting engineering firm participated in the design of the Matson Navigation Co. and the Pacific Gas & Electric Co. buildings in San Francisco and the Chrysler plant in San Leandro.

"BERG"
CONCRETE SURFACER
MODEL A



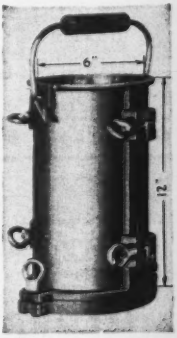
"Berg"' equipment is used extensively for surfacing and finishing applications on concrete construction.

The many "BERG" Models available, permit exact selection for your particular application.

The distinctive "BERG" features give you the kind of results that are realized in better quality work, combined with lower costs.

"BERG" Heads and Attachments are interchangeable, thereby providing adaptability for vibrating, wire brushing, sanding and polishing applications.

THE CONCRETE SURFACING MACHINERY CO.
4667 SPRING GROVE AVE.
CINCINNATI 32, OHIO



MOLINE
STOCK SIZES
Model A 6x12"
Model B 8x16"

YOU GET
ACCURATE TEST SPECIMENS
QUICKLY WITH THIS MOLD!

Accurately machined to produce concrete samples of exact measurement. Sturdily made of refined malleable iron. Strong bronze wing nuts and swing bolts. Inside dimensions shown above. Portable. Your order will be promptly handled. If you want additional information write

MOLINE IRON WORKS
MOLINE, ILLINOIS, U. S. A.
SEVENTY YEARS OF SERVICE

MATERIALS AND LABOR PRICES

Market quotations on construction materials and wage rates reported monthly by ENR correspondents
April Materials, and Labor Prices will appear in April 5, 1951 issue

CEMENT, AGGREGATE, READY-MIXED CONCRETE—F. O. B. CITY

	PORTLAND CEMENT* Per bbl. C/L lots cash. dis. not deducted			SAND AND GRAVEL Per ton. carload lots			CRUSHED STONE Per ton. carload lots		CRUSHED SLAG Per ton. carload lots, f.o.b. plant		CONCRETE BLOCK 8 x 8 x 16-in.; truckload del.; per block		CONCRETE Ready Mixed 1:2:4, over. 50 c.y., del.
	Paper	Bulk	Mortar	Gravel, 1½ in.	Gravel, ¾ in.	Sand	1½ in.	¾ in.	1½ in.	¾ in.	Sand grav.	Lt. wgt. agg.	
Atlanta	$3.63	$3.35	3.10	$2.00	$2.00	$1.75	$2.10	$2.10	$1.65	$1.85	$0.186	$0.186	$11.00
Baltimore	3.64	3.34	3.30	2.50‡a	2.50‡a	2.00‡a	2.70‡a	2.80‡a	2.60‡a	2.55‡a	.17	.17a	10.80
Birmingham	3.11	2.68	2.82g	2.24n	2.24n	1.94n	2.50	2.50	1.10	1.30	.165	.165	7.85
Boston	3.92	3.61	3.55	2.50a	....	2.50a	1.50a	1.60a	....	....	.206	.22a	11.50h
Chicago	3.29	2.99	3.94	3.00‡b	3.00‡b	3.40‡b	3.00‡b	3.00‡b	2.00‡	2.00‡	.22	.22b	11.50
Cincinnati	3.46	3.18	3.16	2.00‡c	2.00‡c	2.05‡c	2.35‡h	2.35‡h	....	....	.20	.215a	10.95f
Cleveland	N. A. in C. L.		....	2.05ef	1.85f	1.65	3.65a	3.65a	2 85‡	2.85‡	....	.23	13.00g
Dallas	2.95	2.65	2.70	2.15	2.15	1.84	2.22	2.38	....	....	.125e	.215	9.30
Denver	3.89	3.64	3.89	1.85	2.00	1.15	....	....	....	....	.22	.255a	10.00
Detroit	3.25f	2.98	3.04	4.00‡b	4.00‡b	3.50‡b	4.00‡	4.00‡	4.00‡	4.00‡	.19	.20a	10.50f
Kansas City	3.30	3.03	3.15	1.90‡	1.90‡	1.50‡a	1.90‡a	1.90‡a	....	....	.24ag	.25e	10.95b
Los Angeles	4.00g	3.52a	4.72	2.10a	2.20a	1.95a	2.08a	2.08a	....	....	.11f	.225	10.50bm
Minneapolis	3.68cd	3.37cd	3.33	2.40‡ag	2.40‡ag	1.45‡ag	2.50‡ag	2.50‡ag	....	....	.23ik	....	11.75fi
Montreal	2.66ac	2.51ac	....	2.50	2.50	1.90i	.85ij	1.10ij	....	....	.22	.20a	10.50ak
New Orleans	3.20e	2.80e	3.18	2.32	2.32	1.82	....	....	1.05	1.25	.25	....	12.90
New York	3.74	3.44	3 32	2.35bk	2.50bk	1.60bk	2.50bl	2.50bl	....	....	....	....	11.40an
Philadelphia	3.38/3.68‡	3.07/3.37‡	3.38‡	2.65‡	2.75‡	2.15‡	2.00‡	2.05‡	1.75	1.65	.22/.25	....	11.50
Pittsburgh	3.32	3.04	....	2.15‡	2.15‡	2.10‡	2.60‡	2.60‡	2.15	2.15	.23d	.23d	11.00
St. Louis	3.28/3.38b	2.94/3.10b	3.10	2 90am	2.70am	2.30/2.70am	1.70j	1.70j	1.15	1.15	.215	.27es	10.40
San Francisco	3.35	2.95	....	1.86	1.86	1.96	1.96	....	....	....	....	.26e	10.75c
Seattle	3.75a	3.25a	3.85	3.00‡bm	3.00‡bm	3.00‡bm	3.50‡bm	3.50‡bm	....	....	.24j	.3325j	10.95j

‡ Delivered. * Prices incl. dealers comm. except as noted.
CEMENT: *a* Subj. to 10¢ dis. *b* Less 2% for cash. *c* CL price dealers, comm. not incl. *d* Dealers sell only LCL. *e* Plus switching charges. *f* Paving up to $3.80 for cement brought in from outside sources. *g* Warehouse pickup.
SAND, GRAVEL, STONE & SLAG: *a* Truck lots. *b* Per cu. yd. *c* 5 tons or more. *e* ½". *f* Pea gravel. *g* Less 5% for cash. *h* Less than 5 tons. *i* Sales tax incl. *j* F.o.b. quarry. *k* Barge lots asd. *l* F.o.b. scow Hudson river. *m* Less 2% for cash. *n* F.o.b. cars.
CONCRETE BLOCK: *a* Cinder. *b* Waylite. *c* Haydite. *d* Celocrete. *e* 5‡ x 8 x 12 in. *f* 8 x 4 x 16. *g* F.o.b. truck at job. *i* Less 2% for cash. *j* Less 1% for cash. *k* 8x8x18.
READY MIXED CONCRETE: *a* 5 cu. yds. or over del. Man. *b* 25 cu. yds. or more. *c* 10–100 cu. brackets. *e* 2,000 lb. concr. *f* 2500 lb. comp. *g* Aver. haul 7–9 mi. zone. *h* Less 50¢ for cash. *i* 5% off for cash. *j* 2% off for cash. *k* Sales tax included. *l* 1:2½:4. *m* F.o.b. yard. *n* Plus escalator clause.

CASH DISCOUNTS CEMENT to Contractors: Truck delivery, 2% for cash on 10th of month; on carload deliveries, no trucking, same as dealer cash discount 10c. per bbl. for payment within 15 days of date of invoice. Subject discount 10c. per bbl. 20 days in Montreal.

CURRENT MAXIMUM PRICES AT CEMENT MILLS

Charge for bags not included. For paper bags add 30¢ per bbl., not refundable

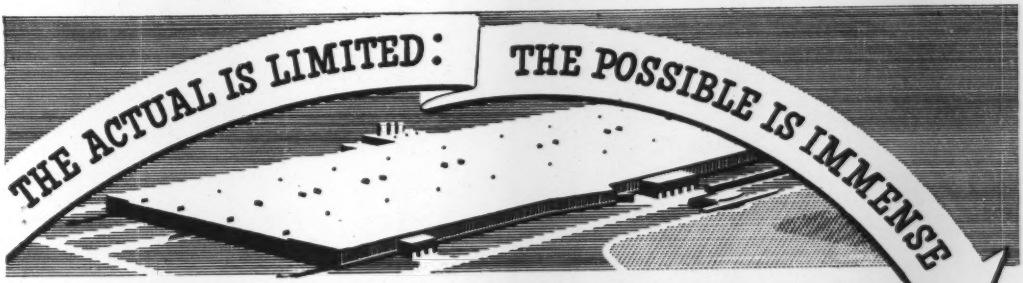
	Bulk		Bulk		Bulk		Bulk
Richard City, Tenn.	$2.60†	Buffington, Ind.	$2.55†	Steelton, Minn.	$2.65†	Muskegon, Mich.	$2.70†	Toledo, O.	$2.60†
Clinchfield, Ga.	2.60†	Independence, Kan.	2.55†	Leeds, Ala.	2.45†	Saginaw, Mich.	2.60†	Milwaukee, Wis.	2.75†
Kingsport, Tenn.	2.60†	Hannibal, Mo.	2.55†	Duluth, Minn.	2.65†	Wyandotte, Mich.	2.60†	Green Bay, Wis.	2.75†
West Des Moines, Iowa	2.65†	Northampton, Pa.	2.60†	Hudson, N. Y.	2.60†	Buffalo, N. Y.	2.60†	Iron ton, O.	2.60†
Nazareth Pa.	2.60†	Universal, Pa.	2.65†	Alpena, Mich.	2.50†	Oswego, N. Y.	2.75†	Montreal City	2.31
Bath, Pa.	2.60†	Waco, Tex. (+ 10¢ tax)	2.50†	Detroit, Mich.	2.60†	Cleveland, O.	2.60†	W. Winfield, Pa.	2.65†

† *Prices to hold for first quarter of* 1951.

PAVING BRICK, BLOCK, ASPHALT, ROAD OILS—F. O. B. CITY

	PAVING BRICK AND BLOCK Granite Per M lots of 50,000 4x4x8 in.	Brick per M 3x4x8½ in. carload lots	Wood per sq. yd. 3½ in. 16-lb. treat	PAVING ASPHALT Per ton, less than 80 penetration Tank car	Drums	ASPHALT BINDERS—FLUXES Per gal., 80–300 penetration Tank car	Drums	CUTBACK ASPHALT Per ton Tank car	Drums	ROAD OIL Per gal. Tank car	Drums	ASPHALT EMULSION (Quick-breaking) Per gal. Tank car	Drums
Atlanta	$73.00	$35.00	$2.25	....	....	....	....	....	....	....	....	....	....
Baltimore	150.00‡	57.70‡	.....	$22.00	.....	$21.00s	$0.15	$.09w	$.17w	$.09i	$.09	$0.12
Birmingham	.....	45.50i	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Boston	.....	.....	.....	24.50a	$35.50a	21.00r**	35.50s**	.09a**	.17**	.085a**	.09**	.17**
Chicago	155.00‡	90.00‡b	4.40/4.60‡f	20.25b	30.25b	19.25bs	29.25bs	.0875bw	.18w	.075b	.....	.....
Cincinnati	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cleveland	.....	55.00d	4.33g	26.50	38.50	26.50s	38.50s	.12w	.24w	.115	.14	28
Dallas	e	40.00	e	23.95	42.99	.1012	.1898	26.99	47.77	.0987	.1062	.1428
Denver	.....	48.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Detroit	.....	90.00	.....	26.25	....	9.30s	.....	.1162w	.....	.092	.....	.215
Kansas City	e	e	e	18.55cl	17.55c	.....	.....	.0725cw	.075w	.0635c	.....	.....
Los Angeles	e	.....	e	15.50dm	15.50dm	15.50ds	15.50ds	17.00d	17.00d	16.00dv	.0825j	.1525j
Minneapolis	.....	.....	2.83h	26.50	36.50	24.50s	35.50s	25.00	35.50	.095	.1225	.2225
Montreal	137.00	e	e	27.00n	36.65n	16.70nu	18.70nu	16.30nu	18.30nu	15.20nu	.184nu	.225nu
New Orleans	.....	.....	.....	17.60ei	.....io	16.50es	.....o	.08ew	.....o	.0775	.08	.145t
New York	.....	.....	2.75f	25.50	28.02g	24.50s	44.04gs	.1040w	.1819gw	.1040	.1040	.1847g
Philadelphia	175.00	110.00	4.06	22.00*	....	22.00s	.....	.09w	.....	.....	.....	.....
Pittsburgh	165.00	48.00	4.60	22.00	36.00	.10	.20	27.00	39.00	.095	.09	.20
St. Louis	.....	.....	.....	19.25f	....	.1633	.....	.0841w	.....	.15	.....	.....
San Francisco	.....	63.73e	.....	17.00q	32.50gp	17.50gkv	.....	19.00g	.....	17.50e	.085	.145
Seattle	.....	.....	.....	17.00k	37.50k	16.75kv	.....	19.50k	23.50kr	18.50kv	.09k	.10k

‡ Delivered.
PAVING BRICK & BLOCK: *a* CL. *b* 3½ x 4 x 8½. *c* 2½ x 8½ x 4. *d* LCL, truck deliveries. *e* Not used. *f* 2" interior 6¢ treat. *g* 3". *h* 8¢ treat. *i* 3 x 3½ x 8½.
ASPHALTS: *a* Price at plant, Everett, Mass. *b* F.o.b. refinery, Lockport, Ill. *c* F.o.b. Sugar Creek, Mo. *d* F.o.b. refinery, El Segunda. *e* F.o.b. Baton Rouge. *f* F.o.b. Wood River or Roxana, Ill. *g* F.o.b. Richmond, Calif. *h* F.o.b. Martinez. *i* Bulk refinery. *j* F.o.b. refinery, Englewood, Calif. *k* 50–110 penetr. *l* Less than 100 penetr. *m* 40–80 penetr. *n* Tax incl. *o* Drums not avail. *p* Shipped in steel bbl. *q* Used drums. *r* In customer's drums. *s* Shipped in drums, per drum. *t* 55-gal. drums. *u* Per 100 gal. *v* Per ton. *w* Per gal. * Effective Jan. 6. 1. Effective Nov. 27, 1950. ** Effective Sept. 15, 1950.
(*Continued on page 69*)



NEW LINCOLN PLANT CREATED BY INCENTIVE-INSPIRED CO-ACTION IN DEVELOPING POSSIBILITIES IN PRODUCT

© LE Co. 1951

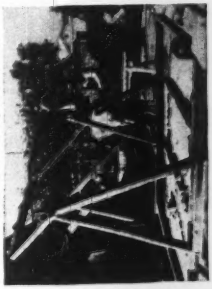
CUTS CONSTRUCTION COST $16,000

THE unit cost of this three-story office building has been reduced from $2.65 per square foot to $1.07 per square foot using welded sectional frames of steel studding.

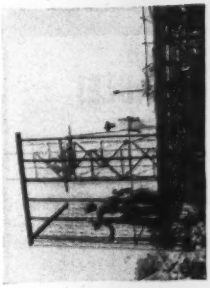
Representing an over-all saving of approximately $16,000, this building was erected in only 3 weeks, less than half the time otherwise required, and without the use of scaffolding. Its welded steel construction is fireproof, shrinkproof and free from warpage and provides greater ease for installing plumbing, wiring and insulation.

HOW TO DESIGN FOR LOWER COST

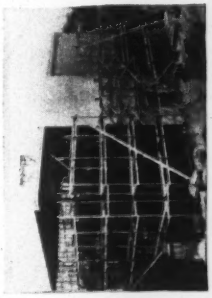
Latest structural design data is presented in the new 9th Edition Procedure Handbook of Arc Welding Design and Practice. Price only $2.00 postpaid in U.S.A.; $2.50 elsewhere.



On-the-ground prefabrication of 10-foot panel sections in assembly jig for fast, downhand welding.

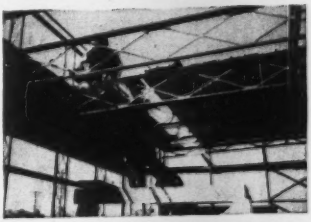


Second floor all-welded sectional panel held in place for tack welding.



The new WKM Valve Co. three-story office building. The Matthews Construction Co. and the Brown Construction Co., contractors.

SAVES $10,000



30% Less Steel required for this garden shop, built with welded design for Sears Roebuck & Company, Compton, California. Construction cost cut from $30,000 to $20,000.

CUTS COST 50%

Direct Saving of 50% over masonry realized in the construction of these multiple-story apartment dwellings in Shorewood, Wisc.

the IMMENSITY of the POSSIBLE

. . . simpler design
less construction time

SEE HOW WELDED DESIGN SIMPLIFIES ERECTION

Studies in Structural Arc Welding free on request. Designers and engineers write on your letterhead to Dept. 131.

THE LINCOLN ELECTRIC COMPANY
CLEVELAND 1, OHIO

These Fenestra Windows in the American Woolen Co., Lawrence, Mass., were commercially hot-dip galvanized and installed in 1922. They are still in fine shape.

NOW MADE EVEN MORE DURABLE!

Over the long years you've seen the loyal performance of Fenestra* Steel Windows. You've seen the ruggedness of fine steel minimize most maintenance . . . the strength and rigidity stand up under years of use. You've seen the fine protection that commercial galvanizing gives steel.

And now Fenestra's *special* galvanizing makes Fenestra Windows even *more* durable.

We call it *special* galvanizing because it's unobtainable anywhere else. Fenestra engineers developed a galvanizing system specifically for Steel Windows and built a special plant around it.

THE REAL SECRET

The real secret of the system is that Fenestra galvanizing is an integral part of the *manufacturing process.*

So get steel-strong windows made to *stay* new—get Fenestra Galvanized Steel Windows. For further information, call your Fenestra Representative (he's listed in the yellow pages of your phone book). Detroit Steel Products Company, Dept. ER-3, 2274 East Grand Boulevard, Detroit 11, Michigan. *®

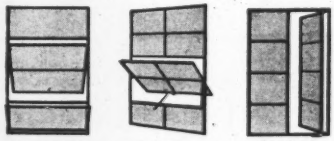
Fenestra's New Hot-Dip Galvanizing Process

1. **Specially Fabricated Parts.** To insure proper galvanizing, fabrication and assembly of window parts are especially engineered.
2. **Hot, Deep-Dip Galvanizing.** Windows are cleaned, rinsed, fluxed, then *completely* immersed in a bath of molten zinc.
3. **Bonderized Finish.** For a perfect finish, windows are Bonderized, then rinsed. Also provides excellent base for paint finish when desired.

Steel-Strong Windows made to STAY new

Fenestra

HOT-DIP GALVANIZED STEEL WINDOWS



Intermediate Industrial Residence

IRON AND STEEL PRODUCTS—PER 100 LBS. BASE MILL PRICES

	STRUCT. SHAPES— PLATE	REINF. BARS billet	RIVETS ½-in. struc- tural	SHEET PILING Base	STEEL RAILS Per Net Ton Standard	Light	Re-rolled	TRACK SUPPLIES Angle Bars	Std Spikes	Tie Plates	Track Bolts
Birmingham Area	$3.65	$3.70	$7.85	....	$72.00	$80.00	Not	$4.70	$6.15	$4.50	....
Chicago Area	3.65	3.70	7.85	$4.45	72.00	80.00	avail-	4.70	6.15	4.50	....
Pittsburgh Area	3.65	3.70	7.85	4.45	72.00	80.00	able	4.70	6.15	4.50	....
Buffalo Area	3.70	3.70	7.85	4.45	72.00	80.00	....	4.70	6.15	4.50	$9.85
Cleveland	....	....	7.85	....	....	....	....	....	6.15	....	9.85
Youngstown Area	....	3.70	....	....	....	....	....	....	6.15	....	....
Geneva	3.65	....	....	....	....	....	....	....	....	....	....
Los Angeles	....	4.40	....	....	....	....	....	....	6.15	....	....
Pueblo	3.65	3.70	....	....	72.00	80.00	....	4.70	6.15	4.50	9.85

IRON AND STEEL PRODUCTS—F. O. B. WAREHOUSE, PER 100 LBS., BASE PRICE

	STRUCTURAL SHAPES Per 100 lb. base price	REINFORCING BARS 5 tons to carload lot *b* New billet	Rail steel	Per 100-lb., base price *u* Add switch	$/cwt for Del.	EXPANDED METAL LATH *k* Per 100 sq. yd., carload lots Std. diamond mesh, 3.4 lb.	Std. ribbed 3.4 lb.	WELDED FABRIC REINFORCING *d* Per 100 sq. ft., carload lots 4x16 in., No. 5 & 10 wires	4x12 in., No. 8 & 12 wires	6x6 in., No 6 & 6 wires
Atlanta	$6.23	$6.05	$6.05	$.025	$.10	$31.50	$31.50			
Baltimore	6.54	5.49*l*	....	....	.10	42.00	45.00			
Birmingham	5.70	5.75	5.75	.05	.15	47.00*p*	52.00*p*			
Boston	6.40*k*	5.80*k*	5.80*kc*	....	.10/.15	39.00	45.00			
Chicago	5.70	4.95*ff*	4.95*ff*	.0625	....	34.50‡	38.50‡			
Cincinnati	6.24*kr*	5.84*r*	5.84	....	....	38.50*uzee*	41.50*uzee*			
Cleveland	5.82	4.81*v*	....	....	.10	37.00‡	40.00‡			
Dallas	8.85	7.00	7.00	....	....	47.85	50.60			
Denver	7.20	7.10*c*	....	....	....	52.00*s*	62.00*qs*			
Detroit	6.09	5.59*n*	....	....	.10	53.00	58.00			
Kansas City	6.30*mn*	5.90*ff*	5.90*ff*	....	....	38.00	40.50			
Los Angeles	6.45*ffkk*	6.15*g*	....	....	.15	48.00	54.00*kk*			
Minneapolis	6.06*kk*	7.32*ll*	7.32*ll*	....	.15	37.00	40.00			
Montreal	6.75*ii*	4.75*i*	4.75*g*	....	....	44.10*k*	46.80*k*			
New Orleans	....	5.40*ok*	....	.05	.10	38.50	41.00			
New York	6.30*r*	6.25	6.25	....	.30	38.50*at*	45.00*at*			
Philadelphia	5.90*k*	5.95*k*	....	....	....	38.00‡	42.00‡			
Pittsburgh	5.40/5.60	5.40/5.60	....	....	.10	34.00	36.50			
St. Louis	6.03	5.34*c*	5.34*c*	....	....	47.00*aa*	53.00*aa*			
San Francisco	7.15*ii*	5.75*l*	....	....	.15	40.50	43.50			
Seattle	4.05*e*	5.35*el*	....	....	....	57.00*amm*	47.00*ammx*			

A.P.M.* Joliet, Illinois, Donora, Penn., $2.66 — F.o.b. Mill: Monessen, Penn., $2.76

A.P.M.* Joliet, Illinois, Donora, Penn. $1.87 — F.o.b. Mill: Monessen, Penn., $1.93

A.P.M.* Joliet, Illinois, Donora, Penn., $2.79 — F.o.b. Mill: Monessen, Penn., $2.89

‡ Delivered. *b* 1–5 tons, add 35¢. Less than 1 ton, add 50¢. *c* 20 tons or over base. *d* Mill price plus freight. *e* F.o.b. plant. *f* Includes delivery in free delivery zone. *g* 10,000 to 39,999 lbs. *h* List price. Dominion tax exempt. Provincial and Municipal tax extra. *i* Plus Dominion, Provincial and Municipal sales tax. *j* Price per ton. *k* F.o.b. city. *l* Intermediate and hard grade, new billet. *m* Per sq.yd. *n* 5–10 tons. *o* 5 to 15 tons base. *p* Del. of 500 sq. yd. or more. *q* Std. ribbed. 4 lb. per sq. yd. *r* 5 tons or over. *s* LCL. *t* Asphalt coated. *u* Note: Revised size extra — 1 in., 1¼ in., 1½ in., 10¢. ⅞ in., ¾ in., 15¢. ½ in., 25¢. ⅜ in., 50¢. ¼ in. 80¢. ⅛ in. $1.90. *v* 20 tons. Straight. *w* Copper bearing. *x* 2.5 lb. per sq. yd. *y* $0.0093 transportation tax included. *z* Copper alloy. *aa* Delivered truck to job. Contractor to do unloading. *dd* F.o.b. dock. *ee* F.o.b. cars. *ff* Carload lots. *gg* Including sales. *hh* 10,000–19,999 lbs. *ii* Rolled at Geneva mill. 400–999 lbs. *kk* ¼" ribbed. *ll* 5 to 8 tons, f.o.b. city. *mm* 2% off for cash. *nn* 1–5 tons. *oo* 10 tons to CL.

PLUMBING, HEATING, WATER, SEWER AND DRAIN PIPE

	C. I. PIPE Per net ton f.o.b. 6 in. to 24 in.	VITRIFIED SEWER PIPE Per foot, Delivered ASTM C13–44T std. 8 in. s.s.	std. 12 in. s.s.	24 in. ds.	36 in. ds.	CLAY DRAIN TILE ASTM C4–24 Per 1,000 ft., carload lots, f.o.b. 6 in.	8 in.	CONCRETE SEWER PIPE Per ft., delivered: ASTMC 14–41 12 in.	24 in.
Atlanta	$99.00	$0.43	$0.67	$3.39	$7.00	$114.00	$140.00	$0.45	$2.00
Baltimore	109.00	.511	.9855	4.05	10.865	168.60	260.40	.90	2.40
Birmingham	93.00	.42	.75	2.99	....	210.00‡	375.00‡	1.25*m*	2.75*m*
Boston	113.00	.561*uwx*	.972*uwy*	4.41*uwy*	12.40*uxy*	181.80*c*	280.30*c*	1.55*mg*	3.80*mg*
Chicago	107.00	.65	1.25	5.10	13.50	150.00‡	270.00‡	.80	2.80
Cincinnati	106.00	.567	1.0935	4.455	11.685	154.80	239.70	.75*m*	2.80*m*
Cleveland	108.00	.462*x*	.891*x*	3.69*x*	10.04*x*	147.00	229.00	.80*m*	3.00*m*
Dallas	107.00	.436	.822	3.234	9.17	.....	.....	.49	1.60
Denver	115.00	.43*dd*	.74*dd*	3.18*dd*	....	.....	.....	.74*m*	2.50*m*
Detroit	108.00	.70	1.35	5.35	14.40	240.00*m*	360.00*m*	.80	3.20
Kansas City	106.00	.50	.88	3.50	....	216.70	.....	.70	3.00*g*
Los Angeles	122.00	.54*l*	1.07*l*	5.24*l*	13.06*l*	228.20	348.90	.85	2.40*ff*
Minneapolis	102.86/112.00	.66*mo*	1.20*mo*	4.85*mo*	....	.....	.....	1.35*kk*	3.85*k*
Montreal	90.00	.77*z*	1.35*z*	4.47*z*	7.23*zz*	.....	72.00*kaa*	218.00*kaa*	
New Orleans	101.50	.453	.82	4.41	8.85*	235.00*bb*	412.00*bb*	.65	2.29
New York	111.00	.70	1.19	4.77	12.71	.....	.....	1.05	2.80
Philadelphia	110.00	.65	1.25	4.95	12.65	300.00‡	350.00‡	1.55*k*	3.75*k*
Pittsburgh	109.00	.386*m*	.752*m*	2.83*m*	7.622*m*	147.50	230.00	1.05*k*	2.50*k*
St. Louis	103.00	.51	.93	3.65	8.50	.....	.....	1.35*il*	3.00*kl*
San Francisco	122.00	.61*d*	1.20*d*	5.03*d*	12.57*d*	240.00*dl*	400.00*dl*	.95	3.20
Seattle	124.00	.51*b*	.91*b*	....	....	150.00*c*	.....	.86*ee*	2.64*ee*

‡ Delivered. Based on existing freight rates; subject to rate change. Gas pipe and class A, $5 per ton additional. 4 in., $5 per ton additional. 30 in. and larger, usually $1 per ton less. *b* Extra strength ASTM C 200–44T. *c* 4-in., $90. *d* SS361-A. *e* 30 in. *g* Culvert pipe. Reinforced, ASTM C76–41. *k* Reinforced. ASTM C75–41. *r* Reinforced. ASTM C76–37. *j* Centrispun. *k* Per 100 ft. *l* F.o.b. plant. *m* Truck delivery. *o* Listed price is based on LCL (no minimum). *p* Less than 5 tons, per price per ft. *t* Within switching limits. *u* ASTM C13–40. *c* C.L. f.o.b. origin, freight allowed. *x* 2 ft. lengths. *y* 3 ft. lengths. *z* CESA A 60–1941 specifications used. *aa* No standard specification in Can. *bb* Freight allowed to destination in city. *cc* Truck loads; f.o.b. plant, Newton. *dd* LCL, delivered, f.o.b. truck. *ee* 1% off for cash. * Not stocked, only made to order. *ff* 21".

*WROUGHT STEEL PIPE—(Full standard weight)

Mill	Butt Weld† Black %	Galv. %	Lap Weld† Black %	Galv. %	Butt Weld, Extra Strong Plain Ends Black %	Galv. %	Double Extra Strong Plain Ends Black %	Galv. %
Lorain, Ohio	43.5	22.0	38.5a	17.5a	43.5	22.0	38.5a	17.5a
Aliquippa, Pa.	43.5	22.0	38.5a	17.5a	43.5	22.0	38.5a	17.5a
Sparrows Pt., Md	41.5	22.0	33.5a	13.5a	41.5	22.0	33.5a	13.5a
Benwood, W. Va.	43.5	24.0	38.0c	18.0c	43.5	24.0	38.0c	18.0c
Youngstown, O.	43.5	24.0			43.5	24.0		
Indiana Harbor, Ind.	42.5	23.0	35.5a	15.5a	42.5	23.0	35.5a	15.5a
Sharon, Pa.	....	....	....	....	43.5	22.0	38.5a	17.5a
Conshohocken, Pa.	....	....	....	....	43.5	22.0	38.0d	17.0d
Elmo, Pa.	....	....	....	....	43.5b	22.0b	24.0ab	10.0ab
Fontana, Calif.	....	....	....	....	32.0b	18.5b		

a 3½ to 4 in. *b* Continuous weld. *c* 5 and 6 in. † Threaded and coupled.

* WROUGHT STEEL PIPE: Discounts from standard list consumers carload prices. Base price approx. $200 per net ton. List prices per ft.: *Butt Weld:* ⅛ in., 5½¢; ¼ in., 6¢; ⅜ in., 6¢; ½ in., 8½¢; ¾ in., 11½¢; 1 in., 17¢; 1¼ in., 23¢; 1½ in., 27½¢; 2 in., 37¢; 2½ in., 58½¢; 3 in., 76½¢. *Lap Weld:* 3½ in., 92¢; 4 in., $1.09; 5 in., $1.48; 6 in., $1.92. Freight rates to destination to be added to price plus 3 percent tax on transportation.

WROUGHT IRON PIPE: List prices per ft. same as wrought steelpipe. Discount for Pittsburgh base. *Butt Weld* — 1 in. and 1¼ in. black, + 20.0, galv. + 48.0; 1½ in. black, + 14.0 galv. + 44.5; 2 in. black, 4 galv. + 34.5. *Lap Weld* — 2½ in. to 3½ in. black + 20.5, galv. + 47.5; 4½ in. to 8 in. black + 17.5, galv. + 45.0. Freight rates to destination to be added to name delivered price.

LUMBER, TIMBER, PLYWOOD—PER M FT., B.M., CARLOAD LOTS F. O. B.

SHORT LEAF YELLOW PINE AND DOUGLAS FIR

All S. L. Y. P. is No. 2 common or better and for No. 1 N. C. Box. (Prices in Bold Face) *All Fir boards, dimensions, planks No. 2, Fir small timbers and timbers are No. 1 Lengths up to 20 ft.* *(Prices in italics)*

	1x6 s4s	1x8 s4s	2x4 s4s	2x6 s4s	2x8 s4s	2x10 s4s	3x12 Rgh	6x12 Rgh	12x12 Rgh
Atlanta	† $75 00	$78 00	$67 50	$69 50	$74 00	$78 00	$77 50	.....	.....
Baltimore	* 88 00	93 00	80 00	85 00	85 00	85 00	90 00	.....	.....
		112 00g	*112 00g*	*112 00g*	*112 00g*	*112 00g*	*115 00*	*$109 00*	*$109 00*
Birmingham	† 83 00	85 00	70 00	80 00	83 00	85 00	95 00	.....	.....
	85 00	*85 00*	*75 00*	*80 00*	*80 00*	*79 00*	*85 00*	*85 00*	*85 00*
Boston	* 94 00a	104 00a	92 00a	93 00a	94 00a	103 00a	.....	.....	.....
	‡ *102 00*	*94 50*	*115 00*	*115 00*	*112 00*	*100 00*	*115 00*	*125 00*	*125 00*
Chicago	**106 00	108 00	95 00	98 00	98 00	106 00	110 00	.....	.....
	111 00	*111 00*	*115 00*	*112 00*	*112 00*	*112 00*	*115 00*	*115 00*	*115 00*
Cincinnati	* 104 50	106 70	93 50	98 00	105 00	105 00	121 00	.....	.....
	125 50	*127 70*	*125 50*	*125 50*	*151 00*	*151 00*	*126 50*	*148 00*	*148 00*
Cleveland	** 97 00	99 00	95 00	97 00	99 00	105 00	*112 00*	*112 00*	*112 00*
Dallas	*k†* 78 00	80 00	69 00	58 00	59 00	59 00	98 00	.....	.....
Denver	* *Not in stock*		*138 00*	*130 00*	*131 00*	*131 00*	*137 00*	*156 00*	*156 00*
Detroit	‡ 100 00	103 00	90 00	100 00	105 00	110 00	.....	.....	.....
	98 00	*99 00*	*100 00*	*101 00*	*98 00*	*98 00*	*106 00*	*110 00*	*115 00*
Kansas City	* 110 120	115 00	120 00	120 00	120 00	120 00	.....	.....	.....
	110 120	*119 00*	*120 00*	*120 00*	*120 00*	*120 00*	*135 00*	*145 00*	*145 00*
Los Angeles	*l* *110 00*	*110 00*	*108 00*	*108 00*	*108 00*	*108 00*	*125 00*	*135 00*	*125 00*
Minneapolis	*i* *130 00*	*130 00*	*130 00*	*130 00*	*130 00*	*130 00*	*150 00*	*150 00*	*150 00*
Montreal	*ab* *92 00*	*98 00*	*93 00*	*95 00*	*107 00*	*109 00*	.....	.....	.....
	175 00	*175 00*	*175 00*	*175 00*	*175 00*	*175 00*	*140 75*	.....	.....
New Orleans	† 80 00	83 00	79 00	80 00	83 00	85 00	100 00	.....	.....
	† *76 00*	*78 00*	*80 00*	*80 00*	*80 00*	*77 50*	*77 00*	*76 00*	*70 00*
New York	‡ 117 120	120 123	105 115	115 120	120 125	125 130	150 160	.....	.....
			Range from $120.00 to $125.00				*145 150*	*145 150*	*145 150*
New York	** 95 00	98 00	80 00	92 00	97 00	101 00	115 00	.....	.....
	105 00	*105 00*	*107 00*	*107 00*	*107 00*	*107 00*	*112 00*	*125 00*	*125 00*
Philadelphia			**Range from $117.00 to $127.00**				117 127	.....	.....
			Range from $130.00 to $140.00				*130 140*	*140 150*	*140 150*
Pittsburgh	†		**Range from $85.00 to $90.00**			90 100	90 105	.....	.....
			Range from $95.00 to $105.00			*95 105*	*105 120*	*140 159*	*140 160*
St. Louis	*fc* 124 50	126 50	110 75d	120 50	125 00e	135 00d	*152 50e*	*164 50*	*164 50*
			136 75a	*136 25e*	*136 25e*	*136 25e*	*74 00*	*74 00*	*74 00*
San Francisco	*A* *75 00*	*75 00*	*72 50*	*72 50*	*70 00*	*72 00*	*82 50g*	*82 50g*	*82 50g*
Seattle	† *82 50g*	*82 50g*	*82 50g*	*82 50g*	*82 50g*	*82 50g*			

	LONG LEAF Y. P.		PLYWOOD	
	Merchantable grade up to 20 ft.		Rail freight increment (See note for base price)	
	2x12 Rgh	12x12 Rgh	3/8"	1/2"
Atlanta			$22.32	$27.24
Baltimore	$145.00	$148.00	22.86	27.90
Birmingham	115.00	130.00	21.78	26.58
Boston	.....	.....	22.86	27.90
Chicago	140.00	140.00	18.72	22.80
Cincinnati	154.00	154.00	21.78	26.58
Cleveland	.....	.....	22.20	27.12
Dallas	108.00	98.00	18.72	22.80
Denver	.....	.....	13.92	16.98
Detroit	115.00	.....	21.78	26.58
Kansas City	.....	.....	16.56	20.16
Los Angeles	.....	.....	13.38*ab*	16.26*ab*
Minneapolis	.....	.....	16.56	20.16
Montreal	.....	.....	.....	.....
New Orleans	135.00	135.00	18.72	22.80
New York	210/240*f*	210/240*f*	22.86	27.90
New York	.....	.....	.....	.....
Philadelphia	190/200	190/200	22.86	27.90
Pittsburgh	95/100	110/120	22.56	27.48
St. Louis	.....	.....	18.72	22.80
San Francisco	.....	.....	10.08*a*	12.30*a*
Seattle	.....	.....	.....	.....

r F.o.b. mill. * F.o.b. city, CL, out of yard. ** F.o.b. city, CL, direct mill shipment ‡ Deliv. to contr. CL. 1. Retail, LCL, at yard. † Retail, LCL, deliv. 2. Deliv. truck lots. 3. asd.

LUMBER: **Bold Face type, Southern Pine.** *Italics, Douglas Fir.* *a* Spruce *b* Tax exempt. *c* 5M lots. *d* 8-12 ft. lengths. *e* 8-16 ft. lengths. *f* 18 ft. or under. *g* No. 1 common. *i* 8 ft. lengths. *k* No. 3 common

A Rail freight rate from Northwest mills to San Francisco are $11.50 to $15.00 per M ft bm. From Northern Calif. mills $9.00 by rail $12.00 by truck to yard with surfaced stock $2.00 to $3.00 less.

PLYWOOD: Special concrete form grade Fir Plywood, 4' by 8' panels, 5-ply, sanded 2 sides, water resistant glue, carload lots, delivered per 1,000 sq. ft. surface. Seattle base price on 3/8", $204.00; on 1/2", $231.00. For other centers add rail freight increment from table on proper size. Oiling and edge sealing charges included. *a* Lower rate by water shipment. *b* 50,000 lb. minimum.

* Freight rate increase of 6¢ per cwt., not included in these figures.

GLASS, EXPLOSIVES, CHEMICALS

	WINDOW GLASS		EXPLOSIVES
	Discounts from jobbers list, Feb. 1, 1950*a*		Per lb. 40% Ammonia Gelatin in 50 lb. cases
	Single or Double Thickness		delivered in 200 lb. lots*
	A quality	B quality	
Atlanta	76%*e*	76%*e*	$0.2275
Baltimore	70–10%	78–10%	.2275
Birmingham	83%	83%	.1750
Boston	79–10%	79–10%	.2275
Chicago	78%*f*	78%*f*	.2275
Cincinnati	78%	78%	.2275
Cleveland	78–10–10%*f*	78–10–10–10%*f*	.2675
Dallas	75%	75%	.2350
Denver	81–5%	81–5%	.2325
Detroit	78–10–10%	78–10–10%	.2275
Kansas City	80–10–10%	80–10–10%	.2325
Los Angeles	75%	80%	.23
Minneapolis	78–10%	78–10%	.2325
Montreal	40–5%*bc*	40–10–5%*bc*	20.00*hi*
New Orleans	83%	83%	.2325
New York	82%*f*	82%*f*	.38*g*
Philadelphia	76%	78%	.2275
Pittsburgh	82%	82%	.20
St. Louis	70–10%*e*	70–10%*e*	.2325
San Francisco	70%	76%	.2275
Seattle	52%*e*	53%*e*	.23

Price of 60% Ammonia Gelatin is $0.0125 per lb. higher than 40%

Glass: *a* Jobbers' list price per box, 14 x 20, ss, $42.75 for A quality, $37.50 for B quality; 14 x 20, ds, $60.00 for A quality, $52.75 for B quality. *b* Discount from list, Sept. 1939; sales tax included, but 6% tax exemption not allowable for. *c* Single thickness. *e* Discount from list of Jan. 16, 1946. *f* Disc from Oct. 1950.

Explosives: * Urban prices influenced by service charges or local storage and delivery regulations do not consistently reflect quantity prices in less congested areas. *g* In borough of Kings, Queens, and Richmond and in Manhattan south of Canal St., add delivery charge of $9.00 per trip. *h* F.o.b. city per 100 lb. forcite, 40%. Forcite 60%, $21.75. *i* F.o.b. Beloeil (near Montreal).

40% Ammonia Gelatin price ranges in other than urban areas, per lb. (except Seismograph Grades)

	C/L 20,000 lb. net	Tons	200 lb. lots
E. of the Miss., except Fla. and Me.	$0.175	$0.2075	$0.2275
W. of Miss. to Rocky Mtn. States, Fla. and Maine	.18 – .1875	.2125– .22	.2325– .24
Rocky Mtn. States	.18 – .1925	.2125– .22	.2325– .245
Pacific N. W. States	.1775– .19	.21 – .2225	.23 – .2425
Pacific S. W. States	.175 – .1825	.2075– .21	.2275– .2325

PILES, TIES F. O. B.

PILES

Prices per linear foot, fir and pine, bark off, f.o.b. cars, New York. Fir based on Wash. and Ore. points to New York shipping area; pine based on freight from Norfolk.

Dimensions	Points	Length	By Rail Pine*	By Rail Fir
12-in. at butt	6-in.	30 to 50-ft.	$0.43	....
12-in.—2-ft. from butt	6-in.	50 to 59-ft.	.46	....
12-in.—2-ft. from butt	6-in.	60 to 69-ft.	.50	....
12-in.—2-ft. from butt	6-in.	90 to 100-ft.	.....	....
13-in.—3-ft. from butt	5-in.	91 to 100-ft.	.....	....
14-in.—2-ft. from butt	6-in.	50 to 69-ft.	.50/.60	....
14-in.—2-ft. from butt	6-in.	70 to 79-ft.	.65	.85
14-in.—2-ft. from butt	5-in.	80 to 85-ft.	.75	.86
14-in.—2-ft. from butt	5-in.	85 to 89-ft.	....	.92
14-in.—2-ft. from butt	5-in.	90 to 100-ft.	....	.94

* Pine piling over 80-ft. available only in limited quantities.

RAILWAY TIES

Prices f.o.b. per tie for carload lots:

		6"x8"x8' Untr.	6"x8"x8' Tr.	7"x9"x8'6" Untr.	7"x9"x8'6" Tr.
Boston	Oak‡	.....	.....	.....	.....
	Pine‡	.....	.....	.....	.....
New York	S. L. Sap Pine	$1.65	$3.00	$2.25	$3.40
	Mixed Oak	2.00	3.20	2.50	3.70
Birmingham	Hardwood	2.00	3.13*a*	2.68	4.16*a*
Chicago	Red Oak	.....	4.00	.....	5.00
Los Angeles	Douglas Fir	.....	.....	.....	.....
	Redwood	.....	.....	.....	.....
Philadelphia	Red Oak	2.15/2.33	3.10/3.13*a*	3.00/3.10	4.15/4.25*a*
St. Louis	White Oak	2.87	.....	3.55	.....
	Red Oak	2.77	3.42*a*	3.53	4.40*a*
	Sap Pine or Cypress	3.25*a*	.....	4.15	.....
San Francisco	Douglas Fir	2.56*e*	3.84*ef*	3.36*bf*	5.04*caf*
Montreal	Birch or Maple	....*h*	....*h*	....*h*	....*h*

Tr.—Treated; Untr.—Untreated. *a* Creosoted. *b* 7" x 9" x 8'. *c* Empty cell. *e* Green. *f* F.o.b. cars. *h* No constant price available. ‡ Not available.

CHEMICALS

Water, sewage treatment, road work, f.o.b. carlots, New York

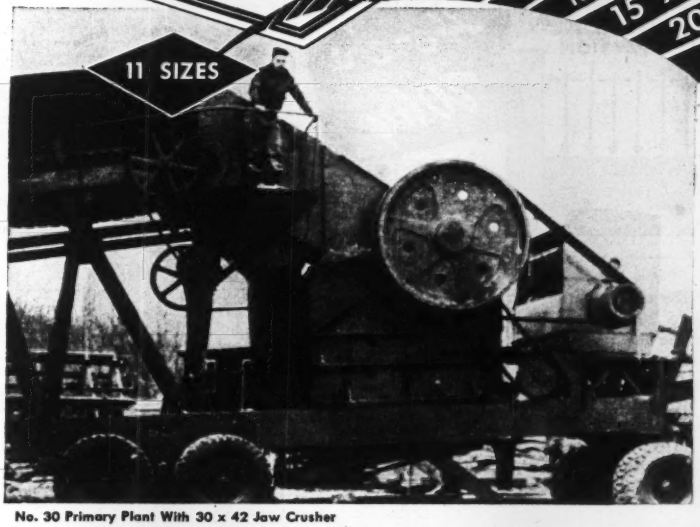
Bleaching powder in drums f.o.b. works, per 100 lb	$6.00
Chlorine cylinders, liquid, per lb. f.o.b. works	.0875
Calcium chloride, 77–80%, flaked, 100-lb. paper bag, f.o.b. works, ton	25.00
Silicate of soda, 52 deg., in drums, f.o.b. works, per 100 lb	2.20
Soda ash, 58%, in paper bags, per 100 lb. dense	1.60
Sulphate of aluminum, commercial, in 100-lb. bags f.o.b. works	1.65
Sulphate of copper, in bags, 99% per 100 lb. f.o.b. works	8.95

(Continued on page 73)

DIAMOND JAW CRUSHERS

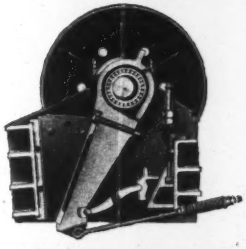
6 x 12 · 10 x 16 · 10 x 20 · 10 x 24 · 10 x 36 · 15 x 24 · 15 x 36 · 20 x 36 · 24 x 36 · 30 x 42 · 36 x 48

11 SIZES

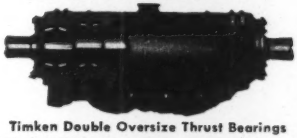


No. 30 Primary Plant With 30 x 42 Jaw Crusher

. . . for every CRUSHING NEED!



Accessible Jaw Adjusting Nuts



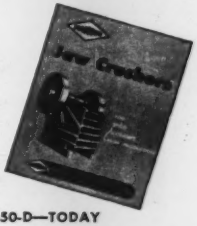
Timken Double Oversize Thrust Bearings

REGARDLESS OF TYPE OF OPERATION, plant size, conditions of the job or capacity required, there's a Diamond Jaw Crusher engineered to give you the utmost in smooth performance, low maintenance, reduced operating costs, and extra capacity. Whether you require a 6 x 12 for experimental work, or a 36 x 48 for extra heavy duty rock busting, you will find the same field proved advantages in every Diamond Jaw Crusher. Diamond's positive and uniform crushing cycle—the "long jaw" design for greater tonnage per square foot of jaw area—the wide jaws for faster feed and discharge—all make possible Diamond's remarkable production records—*production at a profit!*

DIAMOND'S SUPERIOR DESIGN FEATURES:

- √ Timken double oversize thrust bearings with excess shock load ratings—stand up longer under both radial and thrust loads.
- √ Direct lubricated bearings equipped with flush and drain openings.
- √ Reversible jaws for maximum service life.
- √ Easy jaw adjustment even while crusher is operating.
- √ Movable jaw equipped with shock absorbing springs.

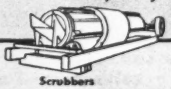
The Crusher is the key to your production volume—determines operating profit or loss. Consult Diamond engineers for the proper Crusher for your particular operation.



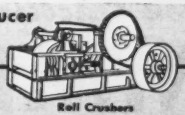
WRITE FOR BULLETIN D-50-D—TODAY

Everything. . . for the aggregate producer

Hammermills


Scrubbers

Screens


Roll Crushers

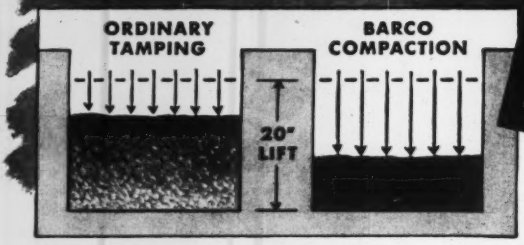
Jaw Crushers

Portable Plants

DIAMOND

DIAMOND IRON WORKS, INC.
AND THE MAHR MANUFACTURING CO. DIV.
1766 N. 2ND STREET, MINNEAPOLIS 11, MINNESOTA

FAS[illegible]ER! BETTER!
SOIL COMPACTION



Here's Why

ONLY the BARCO RAMMER can produce specified compaction on lifts up to 20 inches*. This is due to the "one-two punch" of the Rammer. The Rammer jumps about 14 inches in normal operation. It drops with the weight of about 200 lbs. Immediately after the impact, the operator trips the handle causing the Rammer to jump into the air again. This gives a follow-through, or thrusting effect, to the original impact. This double impact differs from the "quick pat" of other tamping devices which tend to produce compaction only on the surface of the fill.

The Barco Rammer is a completely self-contained unit; no auxiliary or extra equipment is required. With a Barco Rammer one man can do the work of five! Ask for the nearest Barco Distributor to give you a demonstration. *Catalog and information on request.* BARCO MANUFACTURING COMPANY, 1814 D Winnemac Ave., Chicago 40, Illinois. In Canada: The Holden Co., Ltd., Montreal.

***With lifts from 12" to 20" and averaging two passes, up to 24 cubic yards can be compacted per hour.**

for soil compaction close to walls, culverts, and abutments —in trenches, ditches

BARCO

"Pegson" Gasoline

RAMMER

Distributors Located in All Principal Cities

FREE ENTERPRISE...THE CORNERSTONE OF AMERICAN PROSPERITY

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

	STRUCTURAL CLAY TILE PARTITION — SCORED			STRUCTURAL CLAY TILE — LOAD BEARING — SCORED			BRICK		LIME		
	Per M. lots of 2,000 pieces or over, 3x12x12 in.	4x12x12 in.	8x12x12 in.	Per M. lots of 2,000 pieces or over, 8x12x12 in.	10x12x12 in.	12x12x12 in.	Per M. in quantity Common backing	Straight hard	Per ton, In paper, Carload lot, Hydrated finishing	Common hydrated	Pulverized, or lump
Atlanta	.....	.....	.....	.....	.....	.....	$20.75	$20.75	$19.00	$17.50	$17.50
Baltimore	$175.00	$185.00	$325.00	$380.00	.....	.....	.37.00*k*	42.00*k*	26.00	20.00	.....
Birmingham	118.00*p*	128.00*p*	236.00*p*	283.00*p*	.....	.....	23.50*ff*	28.00*gg*	26.37	17.10	.....
Boston	149.00†	161.50†	298.00†	338.00†	.....	.....	33.50*i*	36.50*i*	32.30†	27.90†	.....
Chicago	135.00	145.00	280.00	.....	.....	.....	21.00	23.00	30.80	26.00	.....
Cincinnati	175.00*j*	185.00*j*	335.00*jdd*	.....	.....	.....	43.00*j*	46.00*j*	26.00*j*	24.25*j*	.....
Cleveland	151.00**	148.00**	.....	.....	.....	.....	32.00	32.00	25.50	23.50	31.00*ee*
Dallas	.....	110.00	.....	.....	.....	.....	18.75	.....	31.90	21.80	.....
Denver	.....	.....	.....	.....	.....	.....	34.00	40.00	34.80*bb*	28.00*bb*	34.00*bb*
Detroit	118.65	126.56	237.30	.....	294.25	$336.40	33.50*cc*	32.50*cc*	32.00	32.00	.....
Kansas City	115.00	122.50	245.00	245.00	303.50	367.00	26.00*o*	26.00*o*	30.50*p*	24.50*p*	27.00*p*
Los Angeles	*r*	*r*	*r*	*r*	*r*	*r*	20.00§	.....	34.00	34.00	35.00
Minneapolis	171.50*p*	192.50*p*	386.00*p*	192.50*wp*	.....	.....	32.00*ep*	36.00	37.00*bbe*	28.00*bbe*	38.00*bbde*
Montreal	143.00*aq*	157.00*au*	292.00*au*	.....	.....	.....	26.50	36.50	24.60	.....	20.00*u*
New Orleans	160.00	160.00	300.00	.....	.....	.....	29.00	.....	38.00	26.00	37.50
New York	121.60*h*	129.70*h*	178.30*ch*	194.60*hn*	.....	.....	38.50	.....	36.00	28.00	.....
Philadelphia	126.30	134.80	252.60	302.74	361.35	455.74	29.00	32.00	36.00	21.50	28.50
Pittsburgh	112.00	117.00	189.00	216.00	279.00	317.00	32.00	40.00*y*	25.00	23.00	2.97*m*
St. Louis	136.00*cc*	156.00*cc*	226.00*cc*	307.50*cc*	345.00*cc*	.....	40.00*dd*	36.25*dd*	.85*aaa*	.60/.65*aaa*	1.10*aaspee*
San Francisco	156.85*a**	177.10*a**	235.30*dda**	187.20*ta**	.....	.....	35.00	.....	26.30	26.30	2.58*m*
Seattle	160.00*ee*	175.00*ee*	.....	175.00*eew*	.....	.....	39.00*s*	49.00*s*	37.50*ahh*	1.50*ff*	3.90*mhh*

† F.o.b. yard Roxbury. *a* Smooth. *b* Per 50 lb. bags. *c* 6 x 12 x 12 in.-3 cell. *d* Pulverized hot. *e* 5%, 10th following month. *g* 5½ x 8 x 12. *h* F.o.b. trucks, job site N.Y.C. *i* F.o.b. warehouse only. *j* Truck load or over. *k* $1.00 discount. *l* Red face. *m* Per bbl., 180 lb. *n* 7½ x 7½ x 12. Speed title. *o* F.o.b. Buffalo. *p* Truck lots. *q* Provincial and Municipal tax extra. *r* Not used because of earthquake danger. *s* 2% discount for cash. *t* 5½ x 8 x 11½. *u* Tax exempt. *v* Sand lime. *w* 5 x 8 x 12. *y* Stacked. *z* Pebble lime price per 80 lb. sack. *aa* Price per sack. Lime not sold per ton. *bb* LCL. *cc* Truck delivery. *dd* 6 x 12 x 12. *ee* Pebble lime. *ff* 80% common. *gg* Select. *hh* LCL. § F.o.b. plant. *ii* Per 60 lb sack, no incr., ton price no longer quoted. ** Only 1 plant producing, quotes on warehouse delivery, previous quotes were truck deliv. * F.o.b. Stockton.

PAINT, ROOFING—F.O.B. CARLOAD LOTS

	RED LEAD	WHITE LEAD	READY-MIXED PAINT			ROOFING SUPPLIES Carload lots f.o.b. factory				
	Per 100 lb. in 600-lb. (Approx.) bbl. Dry *a*	Per 100 lb. in 100 lb. cases in oil *w*	Per gal., drums Graphite *b*	Aluminum *c*	Ferric Oxide *d*	Rolls, slate surfaced, 85–90 lb. per sq.	Asphalt felt, per 100 lb.	Tar felt, per 100 lb.	Asphalt coating per gal.	Tar pitch 360 lb. bbl. per ton
Atlanta	$20.75	$31.025	$1.75	$2.70	$1.65	$2.06	$2.06‡	$2.06‡	$1.00‡	$36.00‡
Baltimore	20.50	30.65	2.65	4.10	3.22	2.90	4.17	4.17	.42	37.00
Birmingham	20.75	31.025	3.90	3.40	.....	2.80	2.75	2.75	.....	40.50*ee*
Boston	20.50	30.65	.....	.....	.....	2.89*q*	2.79*o*	2.79*o*	.42	42.00
Chicago	20.50	30.65	.....	.....	.....	2.73‡*u*	3.04‡*o*	3.04‡*o*	38.00‡*bbr*	43.00‡
Cincinnati	20.50	30.65	.....	.....	.....	2.50	2.50*o*	2.50/2.75	.42*y*	42.36
Cleveland	20.50	30.65	2.75*pgg*	3.00*gg*	2.65	2.50*q*	2.50*o*	2.50*o*	.36*y*	40.00
Dallas	20.75	31.40	.....	4.05	.....	3.50*q*	3.75*o*	4.35*o*	.36	46.00
Denver	21.00	31.15	2.96	4.50	2.86	3.25*o*	2.76*o*	2.76*o*	.47*ff*	42.00
Detroit	20.50	30.65	2.35	3.30	2.50	2.50	2.50*f*	2.50	.51	40.00
Kansas City	20.50	30.77	.....	2.71	2.65	2.39	2.43*o*	2.43*o*	.313	48.00
Los Angeles	20.50	30.90	3.30	4.50	4.20	2.97	2.01*e*	*l*	.44	*l*
Minneapolis	20.50	28.55/30.77	.....	.....	.....	2.50*idd*	2.50*idd*	2.50*idd*	.34*idd*	37.00*r*
Montreal	.....	20.70	3.75*t*	4.20*t*	4.62*t*	3.50*t*	3.25*ff*	3.25*ff*	1.10*t*	2.90*kt*
New York	20.50	30.65	3.45*y*	.....	.....	2.50	2.50*o*	2.50*o*	.34*z*	37.00
Philadelphia	20.50	30.65	3.25	3.65	3.15	2.54	2.94	2.94	.37	26.00
Pittsburgh	20.50	30.65	2.45	2.55	2.20	2.90	2.90*o*	2.90*o*	.39	42.00
St. Louis	20.50	30.65	.....	.....	.....	2.50	2.50*h*	2.75*h*	.31*y*	38.00
San Francisco	20.50	30.90	2.40	3.40*n*	1.35	2.61	3.50*aa*	.....	.41	.....
Seattle	20.50	31.15	2.51*m*	2.67*m*	.....	3.58*mqcc*	3.05*hmcc*	.....	.59*mcc*	52.00/*mcc*

‡ Delivered. Note: Red lead in oil 50c higher than white lead in oil. *a* Red lead prices change frequently due to pig lead price changes. *b* U. S. War Dept. Spec. 3–49A. *c* ASTM Spec. D266–31. *d* 80% minimum ferric oxide. *e* 15 lb. *f* Per 432 sq. ft. *h* Per roll. 65 lb. *i* Net carload lot prices; Minneapolis and vicinity. *j* Asphalt pitch. *k* Per cwt. *l* Not used. *m* 1% discount for cash. *n* May, 1941 price. *o* Per 50-lb. *p* 6-drum. *q* Per 90-lb. roll. *r* F.o.b. factory Chicago. *s* ASTM Spec. D266–41. *t* Federal tax included. *u* Per 90 lb. square. *v* Per ton. *w* Price to large paint contractors is $1.25 less. *x* Mineral surfaced. *y* 55-gallon container. *z* Drums *aa* Approximate cost per 100 lbs. *bb* Roofers coating and cement. Price per ton. *cc* LCL, truck delivery. *dd* 2% cash discount. *ee* Asphalt, in 100 lb. package. *ff* 5-gal. drums. *gg* F.o.b. factory.

SKILLED AND COMMON WAGE RATES—PER HOUR

	Brick-layers	Car-penters	Struct. Iron Workers	Hoisting Engineers	Plas-terers	Electrical Workers	Steam-fitters	Common Labor Building	Common Labor Heavy Const.
Atlanta	$2.50	$2.00	$2.25	$2.25	$2.50	$2.50	$2.35	$1.05	$1.05
Baltimore	3.00	2.35	2.65	2.60/2.80	2.50	2.50/2.75‡	2.50	1.35	1.35
Birmingham	2.75	2.125	2.35	1.975	2.30	2.50	2.50	1.10	1.20
Boston	2.775	2.375	2.70	2.60	2.85	2.60	2.60	1.75	1.75
Chicago	2.625*k*	2.55	2.60	2.50	2.81*n*	2.71*n*	2.60	1.90*m*	1.90*m*
Cincinnati	2.70	2.325	2.45	1.675/2.675	2.50	2.70	2.55	1.65	1.65
Cleveland	2.70*t*	2.825*t*	2.825	2.525	2.825	2.825	2.825	2.10	1.85
Dallas	3.125†	2.25	2.50	2.25	3.125†	2.50	2.375	1.20	1.35
Denver	3.00	2.35	2.25	2.35	3.00	2.50	2.40	1.50	1.50
Detroit	2.85	2.60	2.85*m*	2.80	2.964*l*	2.85	2.75*m*	1.90	1.90
Kansas City	2.675	2.225	2.375	2.225/2.45	2.825	2.425	2.625	1.65	1.65
Los Angeles	2.75	2.35	2.50	2.30	3.125	2.625	2.625	1.75	1.75
Minneapolis	2.40	2.12	2.275	2.07	2.50	2.41*n*	2.435	1.52	1.52
New Orleans	2.60	1.975	2.35	2.225	2.275	2.40	2.35	1.10	1.10
New York	3.548*r*	3.09*bo*	3.348*o*	3.348*o*	3.599*ar*	3.456*as*	3.286*p*	1.90	1.90
Philadelphia	3.31*t*	2.525	2.89*t*	2.65	3.075*k*	3.03/3.283*u*	2.825*k*	1.475	1.775
Pittsburgh	3.00	2.65	2.625	2.80	2.625	2.625	2.80	1.60	1.60
St. Louis	3.09*e*	2.50*h*	2.50	2.55	2.875	2.6775*e*	2.625	1.65	1.65/1.80
San Francisco	3.25*b*	2.375	2.575	2.19	3.00	2.75	2.625	1.65	1.65
Seattle	3.25	2.30	2.50	2.45	3.00	2.65	2.75	1.90	1.95
Montreal*	1.60	1.40	1.50	1.30	1.60	1.50	1.55	1.00	.85

a 6 hr. day. *b* 7 hr. day. *c* Incl. 3% vacation stamp fund for bricklayers; 2% for electricians. * Cost of living bonus now included in basic wage. *t* Includes 5¢ per hr. tool replacement. † Plus $5.00 daily bonus. *h* $2.20 homes and housing + 5¢ vacation fund. *i* Incl. 2% welfare. *j* Incl. 9¢/hr. welfare. *k* Incl.7½ ¢/hr. welfare fund. *l* Incl. 4% vacation fund. *m* Incl. 5¢/hr. welfare ins. fund. *n* Incl. 6¢/hr. welfare fund. *o* Incl. 3% welfare fund. *p* Incl. 3% welfare fund and 3% pension fund. *r* Incl. 3% welfare fund and 20¢ pension fund. *s* Incl. 4% welfare and pension fund and 4% vacation fund. *u* Incl. 1% welfare fund. *t* Still negotiating as we go to press. ‡ 2.50 on old work, 2.75 on new contract.

MEXICO CITY PRICES

In Pesos, F.o.b. City		Jan. '51	Feb. '51
Common Wages—Building (8 hr. day)	av. per hr.	.62*	.72*
Common Wages—Heavy Const. (8 hr. day)	av. per hr.	.75*	.88*
Skilled Labor Wages			
Carpenters (8 hr. day)	av. per hr.	1.88*	2.19*
Bricklayers (8 hr. day)	av. per hr.	1.88*	2.19*
Struct. Iron Workers (8 hr. day)	av. per hr.	1.50*	1.50*
Struct. Steel Shapes 3"–15" x 12 meters	per metric ton	1,073.30	1,073.30
Reinf. Steel, Corr. Rods			
¼" x 11 meters	per ton	1,218.30	1,218.30
⅜" x 11 meters	per ton	1,208.30	1,208.30
½" x 11 meters	per ton	1,198.30	1,198.30
⅝" x 11 meters	per ton	1,188.30	1,188.30
¾" x 11 meters	per ton	1,188.30	1,188.30
1" x 11 meters	per ton	1,188.30	1,188.30
Gravel truck load of 3½ cu. meters			
Blue Gravel	per tr. load	36.00	36.00
Rose Gravel	per tr. load	34.00	34.00
Cement, Std. Port. (Tolteca)	per ton	125.00	125.00
Lumber			
Mex. Sacred Fir (Oyamel)	per M ft.	800.00	800.00
1st Class Pine	per M ft.	1050.00	1050.00
2nd Class Pine	per M ft.	950.00	950.00

* Increase by 1/6th—work 6 days, paid for 7 days.

ENR Skilled Average: (Bricklayers, Carpenters, Ironworkers). $2.619 **ENR Common Average:** $1.595.

CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

ELSIE EAVES, Manager *J. A. MAHONEY, Reports* *M. R. ROESSLER, Statistics*

NEW ENGLAND

LOW BIDDERS—HEAVY CONSTRUCTION

† **Great Lakes Dredge & Dock Co.,** 17 Battery Pl., New York, N. Y. Low Bidder. $812,050. imprv. dredging in Boston Harbor, exten. 40 ft. channel from Commonwealth Pier 1 to head of Harbor to Mystic River, MASSACHUSETTS, U. S. Eng., P.O. Box 2316, Boston, 7, Mass. Bids Feb. 16.

MIDDLE ATLANTIC

LOW BIDDERS—HEAVY CONSTRUCTION

† **Camden Constr. Co.,** 1301 Towson St., Baltimore 2, Md. Low Bidder. $396,504. 2 rein.-con. bridges 0.439 mi., over Riverdale Rd., box culverts at Carters Creek, Baltimore-Washington Parkway, Proj. 182, Prince Georges Co., MARYLAND, Bureau P. Rds., Dpt. Commerce, 1440 Columbia Pike, Arlington, Va. Bids Feb. 14. CD 1/16.

LOW BIDDERS—BUILDINGS

▲ **John T. Brady & Co.,** 606 W. 47 St., New York 19, N. Y. Low Bidder. $2,892,840. general constr.*** **Jesse E. Kahn** 242 W. 20 St., New York, N. Y. $407,567, plumbing***Almiral & Co., Inc.,** 53 Park Pl., New York, N. Y., $717,237, heating and ventilating***E. A. Kahn & Co.,** 163-18 Jamaica Ave., Jamaica, N. Y. $580,000, electrical work for Queens General HOSPITAL, JAMAICA, N. Y. Dpt. P. Wks., Municipal Bldg., New York, 7, N. Y. Bids Feb. 15. CD 1/29.

▲† **Cauldwell-Wingate Co.,** 101 Park Ave., New York 17, N. Y. Low Bidder, $19,177,000. Veterans HOSPITAL, First Ave. and 23 St., NEW YORK, N. Y. U. S. Eng., 80 Lafayette St., New York 13, N. Y. Bids Feb. 20. CD 2/12, under LB.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

N. C., **Raleigh**—B.A. 3/15—City, P. D. Snipes, mayor, City Hall, raw water facilities, Sect. 3, alterations, addns. to gate house, spillway and dam; Sect. 4, highway bridges, Sect. 5, highway (bridge approaches). Plans deposit $25. Pierson & Whitman, Security Bank Bldg., engrs. CD 2/7.

▲ **Va., Norfolk**—B.A. 3/16—City, R. F. Wagner, ch. engr. Dpt. P. Wks., City Hall, Contr. 9, 48 in. water transmission main. $1,900,000. Plans deposit $25. CD 10/17.

† **Louisiana**—B.A. 3/20—U. S. Eng., foot of Prytania St., New Orleans, excav. approx. 646,000 cu. yd. material for alternate navigation route of Intercoastal Waterway, Algiers-New Orleans, Inv. 51-160. CD 6/26/46.

LOW BIDDERS—HEAVY CONSTRUCTION

Harvey H. Stewart, 1200 S. Graham St., Charlotte, N. C. Low Bidder, $139,214, overpass of Norfolk & Western R. R. 2 mi. north of Boone Mill, U. S. 220, Roanoke Co.***Ralph E. Mills Co., Inc.,** 1210 Tennessee St., Salem, Va. $548,502, 607 ft. bridge and 0.83 mi. approach road U. S. 60 between Covington and Clifton Forge, Alleghany Co.***J. Kenon Perrin Co.,** 5 and Cary Sts., Richmond, Va. $68,381, wid'n. overpass and approaches over R. F. & P. R. R. Route 147, in city of Richmond, VIRGINIA. State Hy. Dpt., Richmond, Va. Bids Feb. 20. CD 2/5.

T **F. Franklin,** R. F. D. 2, Salem, Va. Low Bidder, $70,538, stabil. base for a service road 2 mi. U. S. 1, between Fredericksburg and Four Mile Fork, Spotsylvania Co.***A. W. Talbott,** Buffalo Springs, Va., $123,584, macad. paving 3.22 mi. between Kingsville and Keysville, U.S. 15, Prince Edward Co.*** **W. H. Scott,** Franklin, Va., $490,812, c. conc. pavement and bridge over Park Tours Rd. at Yorktown, 4.6 mi. U. S. 17 forming approaches to York River Bridge, Gloucester and York Counties***E. W. Woolfork,** Hopewell, Va., $72,917, hard surf. and 44 ft. bridge 2.41 mi. Secondary Route 656, from Fredericks Hall south, Louisa Co.*** **Pendleton Constr. Corp.,** Wytheville, Va., $60,434, hard surf. 3.68 mi. west of Huddle, Secondary Routes 690,642 and 619, Wythe Co., VIRGINIA. State Hy. Dpt., Richmond, Va. Bids Feb. 20. CD 2/5.

▲ **Porter-DeWitt Constr. Co.,** Poplar Bluff, Ky., Low Bidder. $107,834, traffic bound surf. 4.984 mi. Oscar-Bandand Rd., Proj. S 202 (1), SP 4-241, Ballard Co.***M. T. Codell & Co., Inc.,** Winchester, Ky., $104,922, traffic bound limestone 2.154 mi. Brooksville-Augusta Rd., Proj. S 342 (3), SP 12-6, Bracken Co.*** **R. R. Dawson Bridge Co.,** Bloomfield, Ky., $518,513, traffic bound river grav. 1.814 mi. Ashland-Greenup-Fullerton Rd., Proj. F 535 (1), SP 45-591, 45-211, Greenup Co.***Mulligan Bros., Inc.,** Greenville, Ky., $147,239, traffic bound limestone 2.571 mi. Central City-Owensboro Rd., Proj. F 368 (1), SP 75-202, McLean Co.***Lovell & Hart Constr. Co.,** 1091 Manchester St., Lexington, Ky., $64,195, traffic bound limestone 2.878 mi. Morehead-Vanceburg Rd., Proj. S 148 (2), SP 103-142, Rowan Co.; $129,468, traffic bound limestone and piling alternate A 2.572 mi. Meadow Branch-Beetle-Elliott Co. Line Rd., Proj. SP 22-688, Carter Co.; $110,712, traffic bound limestone 6.01 mi. Ky. 7-Trench-Stephens Rd., Proj. RS 32-109, 32-569, Elliott Co., KENTUCKY. State Hy. Dpt., Frankfort, Ky. Bids Feb. 16. CD 2/1.

LOW BIDDERS—BUILDINGS

Dewey G. Weddle & Co., Natl. Bank of Commerce Bldg., Norfolk, Va. Low Bidder. $949,000. general constr. Norfolk's low rent public HOUSING Community No. Va. 6-5, NORFOLK, VA. Norfolk Redevelopment & Housing Auth., Dickson Bldg., Norfolk, Va. Bids Feb. 14. CD 1/17.

Switzer Willig Co., Trafton Ave., Lexington, Ky. Low Bidder. $453,113. SCIENCE BLDG. addn. at Eastern State College, RICHMOND, KY. Commonwealth of Ky., New State Office Bldg., Frankfort, Ky. Bids Feb. 15. CD 1/18.

J. A. Jones Constr. Co., 133 Ellis St. N. E., Atlanta, Ga. Low Bidder. $488,700. memorial HOSPITAL, SEWANEE, TENN. University of the South, Sewanee, Tenn. CD 1/25.

CONTRACTS—HEAVY CONSTRUCTION

E. C. Bridges, Heath Springs, S. C. Contract Awarded. $365,551. 250 mi. rural distr. lines, Oconee, Pickens, Greenville and Anderson Counties, SOUTH CAROLINA. Blue Ridge Electric Co-operative, Pickens, S. C. Bids Feb. 8. CD 1/31.

Westinghouse Electric Corp., 306 Fourth Ave., Pittsburgh 30, Pa. Contract Awarded. $600,000. electrical equipment contract for expansion sys. incl. switchgear, motor starters, control centers, ventilating fans, pipe lines from Baton Rouge to Bremen, LOUISIANA, MISSISSIPPI, ALABAMA, GEORGIA, SOUTH CAROLINA AND NORTH CAROLINA. Plantation Pipe Line Co., (Standard Oil Co. of New Jersey, Standard Oil Co. of Kentucky and Shell Oil Co.), Healey Bldg., Atlanta, Ga. Bids Feb. 15. CD 2/16.

CONTRACTS—BUILDINGS

E. J. Vaughn, 2121 30 Ave., Meridian, Miss. Contract Awarded. $300,000. CHURCH, MERIDIAN, MISS. First Baptist Church, 701 26 Ave., Meridian, Miss.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

Mich., **Flint**—Bids Asked—City, Theodore D. Moss, dir. P. Wks., structural steel water sys., constr. Dam Flint River and Reservoir.

BIDS ASKED—BUILDINGS

Mich., **Homer**—SCHOOL—B.A. 3/14—City, Dr. R. K. Curry, secy. 1 story, brick, concrete Community School addn. Plans deposit $20 refundable. Lewis J. Sarvis, 258 Champion St., Battle Creek, archt. CD 8/25/50.

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000.

Classes of Construction

(Name In order of Listing)

Water Supply	Latin America
Sewers, Waste Disposal	Public Buildings
Bridges	Commercial Buildings
Streets & Roads	Industrial Buildings
Earthwork, Waterways	Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
B.A.	Bids Asked
ENR	Engineering News-Record
CD	Engineering News-Record Construction Daily

Mich., **Grand Rapids** — HOSPITAL — B.A. 3/15 — Bd. Trustees Butterworth Hospital, 300 Bostwick St. N. E., 4 story, brick, steel, concrete hospital, $300,000, J. E. Stephens Assoc., 320 W. Lafayette Blvd., Detroit, engrs. CD 12/1.

O., **Dayton**—SCHOOL—B.A. 3/17—Bd. Educ., Jefferson Twp. School Dist., Ethan Eshbaugh, clk., R. R. 6, Box 231 A. Zone 7, 2 story ground floor, brick, concrete school addn., heating and ventilating sys. imprvs. Walter A. Rabold, 245 Elmhurst Rd., archts. John F. Surmann, 11 W. Monument Ave., assoc. archts. CD 10/5.

Mich., **Vanderbilt** — SCHOOL — B.A. 3/19 — Bd. Educ., Vanderbilt Rural School, M. H. White, secy., 1 story, 136x234 ft., cinder block, brick, steel school, $400,000. Plans deposit $20, refunded. R. A. Lawson, 122 S. Bailey St., Cheboygan, engr.

LOW BIDDERS—HEAVY CONSTRUCTION

▲ **Mathy & Thornton Constr. Companies,** La Crosse, Wis. Low Bidder, $109,882, Contr. 2, b.conc. S.T.Hys. 35 and 54, The Bluff Siding,-Fountain City Road, Proj. F 028-1 (27), Buffalo Co.; $240,072, Contr. 1, b.conc., The West County Line-Galesville and Galesville-South County Line Road, S.T.Hys. 35 and 54 and U.S. Hy. 53, Proj. F 028-1 (30 and T 08-3 (12), Trempealeau Co.; $203,907, Contr. 5, plant mix bit. surf. 15.914 mi. The Mount Hope-Boscobel Rd., S.T.Hy. 132, Proj. T 0335 (1), Grant Co.***Rein & Schultz,** Madison, Wis., $74,204, Contr. 3, bit. 5,093 mi. The Symco-Bear Creek Corners Road, S.T.Hy. 22, Waupaca Co., Proj. T 035 (5); $113,230, Contr. 3, bit. 7,955 mi. The Wautoma-Wild Rose Rd., S.T.Hy. 22, Proj. T 038-1(1), Waushara Co.***Koch Constr. Co.,** 239 W. Center St., Milwaukee, Wis., $336,636, Contr. 1, c.conc. 5.264 mi. The Peshtigo-Marinette Rd., U.S.Hy. 41, Proj. F 02-5 (24), Marinette Co.***R.R.Birdsall & Sons Co.,** Racine, Wis., $136,322, Contr. 1, c.conc. 3.028 mi. The Illinois State Line-U.S.H. 61 Rd., S.T.Hy. 35, Proj. F 030-1(23), Grant Co.***Rock Road Constr. Co.,** Madison, Wis. $300,529, Contr. 1, b.conc. 10.574 mi. The S.T.H. 11-East County Line and West County Line-S.T.H. 89 Roads, U.S.Hy. 14, Projs. T 014-2(8) and T 014-3(15) Rock and Walworth Counties***Badger Highways Inc.,** Menasha, Wis., $92,275, Contr. 3, bit. 6.521 mi. The Manchester-Princeton Rd., S.T.Hy. 73, Proj. S0293(3), Green Lake Co.***Rasmussen Constr. Co.** Oshkosh, Wis., $435,061, Contr. 1, b.conc. The Waldo Bouleveard, Valders Manitowoc and South County Line-U.S.H. 151 Rds.; U.S. Hy. 10, 141, 151 and S.T.Hy. 42, Proj. T 019-4(3), T 035-2(2) and T 01-4(6), T04-4(1) Manitowoc Co. ***J. W. Craig Co.,** 1814 N. E. California St., Minneapolis, Minn., $89,820, Contr. 2, bit. 7.184 mi. The Hixton-Alma Center Rd., S.T.Hy. 95, Proj. T 053 (3), Jackson Co.***Alexander Constr. Co.,** 4641 Hiawatha St., Minneapolis, Minn., $247,263, Contr. 1, b.conc. 11.343 mi. The C.T.H.M.-North County Line Rd., S.T.Hy. 13, Proj. T 04-4(7), Taylor Co.***Payne Dolan of Wisconsin Inc.,** 735 N. Water St., Milwaukee, Wis., $122,729, Contr. 1 b.conc. 4.237 mi. The Antigo-Mattek's Corner Rd., U.S.Hy. 45 Proj. T 09-2(9), Langlade Co., WISCONSIN State Hy. Comn., Madison, Wis. Bids Feb. 20. CD 1/31.

CONTRACTS—HEAVY CONSTRUCTION

Greenfield Constr. Co., 16596 Greenfield St., Detroit, Mich. Contract Awarded. $430,700. trunk sewer Hassel St., PW 1415, DETROIT, MICH. City, Carl D. Warner, comr. P. Wks. Dpt., Detroit, Mich. Bids Feb. 19. CD 11/28.

CONTRACTS—BUILDINGS

Charles Ford Co., Dearborn, Mich. Contract Awarded. $400,000. 2 story, bsmnt., brick, steel Dr. Edward S. Snow SCHOOL, Culver Ave., DEARBORN, MICH. City, Albert W. Rider, secy. Dist. School Bldg., Dearborn, Mich. T. R. Jahr Assoc., Inc., 21905 Michigan Ave., Dearborn, Mich., archt. Bids Jan. 10.

A. W. Kutsche & Co., 2924 W. Grand Blvd., Detroit, Mich. Contract Awarded. $300,000. 1 story, bsmnt., brick, stone CHURCH, 12 Mile Rd., DETROIT, MICH. St. Dennis R. C. Parish, Stevenson and 12 Mile Rd., Detroit, Mich. CD 2/20.

W. E. Wood Co., 4649 Humbolt St., Detroit, Mich. Contract Awarded. $400,000. 2 story, bsmnt., brick, stone RECREATION CENTER BLDG., Webb St., DETROIT, MICH. Visitation Parish, 1946 Webb St., Detroit, Mich. Diehl & Diehl, 120 Madison Ave., Detroit, Mich., archts.

Walter Neller Co., C. D. Deeg, supt., 115 W. Michigan St., Lansing, Mich. Owner Builds. $900,000. seventy 2 story homes. Colonial Village No. 1, Gordon and Quentin Aves., LANSING, MICH.

▲ **Garling Constr. Co.,** 6922 N. Telegraph Rd., Detroit, Mich. Owner Builds. $1,200,000. 100 brick HOMES, LIVONIA, MICH.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

Minn., **Clearbrook**—B.A. 3/13—Village, E. Lewis, clk., sanitary sewer collection sys., waste treatment plant, $75,000. Plans deposit $10. W. C. Larson, Detroit Lakes, engr.

(Continued on page 76)

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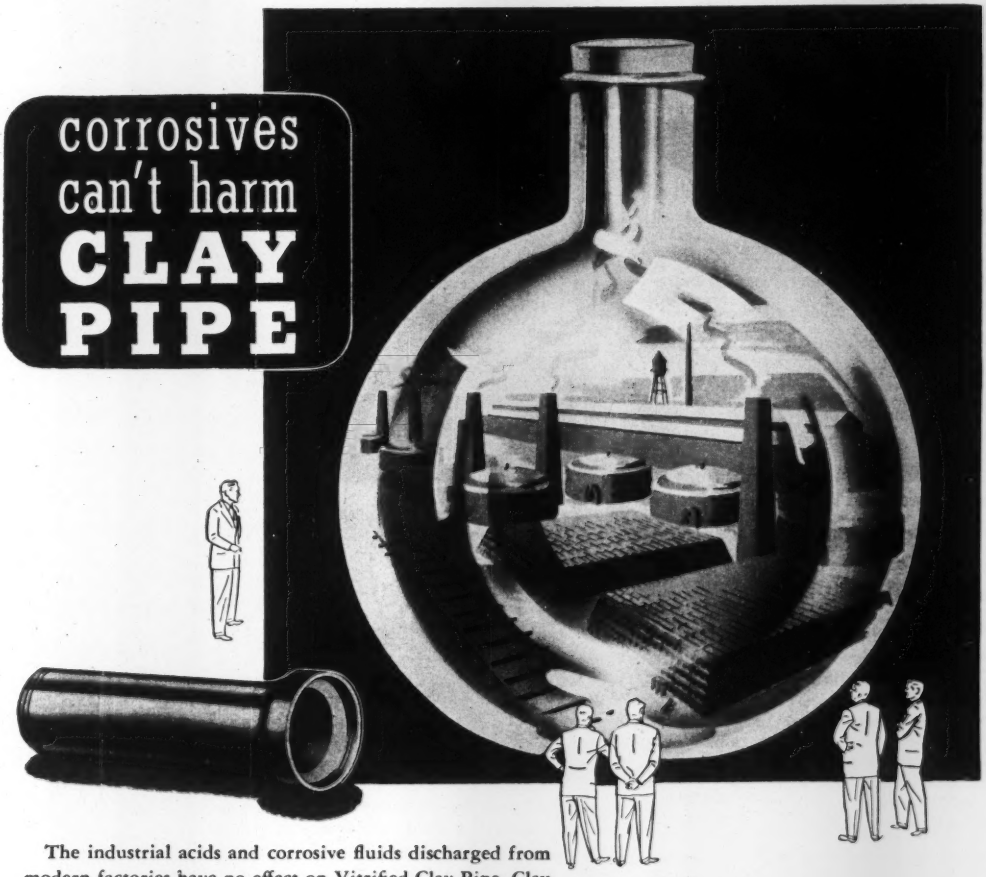

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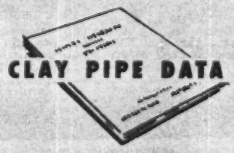

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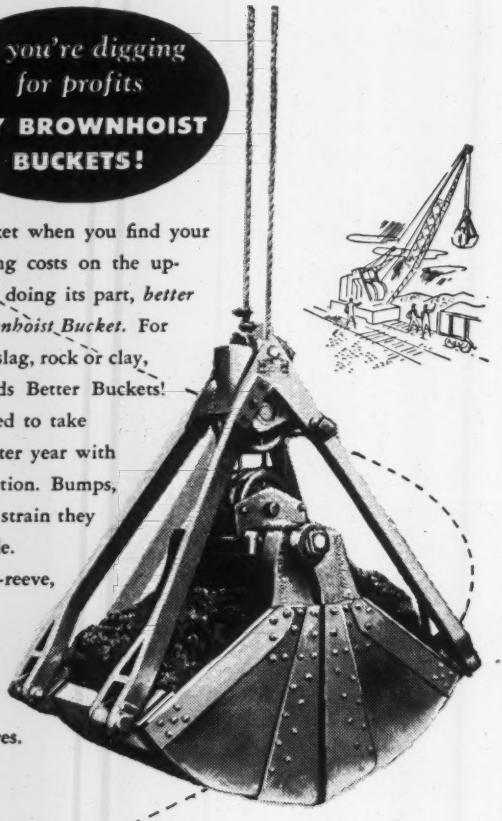

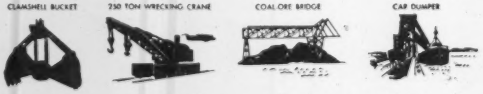

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(Continued from page 74)

† **Montana**—TRANSMISSION LINE—B.A. 3/27—Bureau Reclamation, Fort Peck, approx. 16 mi., Fort Peck-Glasgow Bench, 69 kilovolt, 3 phase, single-circuit, wood-pile, H-frame type transmission line, Fort Peck Dam in northeast portion of Montana, Fort Peck Proj., Spec. DC 3332.

† **Colorado**—B.A. 3/28—Bureau Reclamation, Dpt. Interior, Fort Collins, constr. North Poudre Supply Canal Diversion Dam and North Poudre Supply Canal from Station 6 plus 60 to Station 678 plus 55, Colorado-Big Thompson Proj., approx. 15 mi. northwest of Ft. Collins, Spec. DC-3331; adv. ENR 3/8.

BIDS ASKED—BUILDINGS

Tex., Longview—PLANT—Bids Asked—Oklahoma Steel Castings Co., Inc., Philtower Bldg., Tulsa, Okla., plant imprvs., expansion $175,000. CD 2/14.

LOW BIDDERS—HEAVY CONSTRUCTION

▲ **Austin Bridge Co.**, P.O. Box 1590, Dallas, Tex., Low Bidder, **$947,746**, Canadian River bridge and approaches Hy. U. S. 60 and 83, Proj. F-621 (8) and F 158 (10), Hemphill Co.; **Russell Smith**, 7827 Bryn Mawr St., Dallas, Tex., **$156,134**, est. $150,000, widen. bridges and approaches on U. S. Hy. 75, F 78 (4), Freestone Co., TEXAS. State Hy. Comn., Austin, Tex. Bids Feb. 21. CD 2/5.

▲ **Hugh McMillan**, Box 1227, El Paso, Tex., Low Bidder, **$125,222**, est. $100,000. flexible base, shoulders and hot mix b. conc. pavement 10.371 mi. Hy. U. S. 80, Proj. 1-1-12, El Paso Co.; **$92,265**, est. $60,000. flexible base and surf. 12.95 mi. Hy. FM 192, R. 957-1-2, Hudspeth Co.***Stone Constr. Co.**, 1008 W. Broadway, Ardmore, Okla., **$72,452**, est. $60,000, base and surf. 8.74 mi. Hy. FM 1225, R. 859-1-1, Haskell Co.; **Fred Hall & Son**, Valley Mills, **$163,362**, est. $200,000 fdn. course and one course surf. tr. 11.92 mi. Hy. SH 101, Proj. S 118 (7), Mitchell Co.***W. R. Boyd**, Inc., Cushing, Tex., **$121,164**, est. $150,000, grading, small structures 6.722 mi. Hy. US 96, Proj. F 327 (10), San Augustine Co.***L. W. Pelphrey Co.**, Gladewater, Tex., **$81,412**, est. $60,000, base and surf. 5.969 mi. Hy. U. S. 271, Franklin and Titus Counties***H. L. Butler & Son**, Hy. 77 and Joe Field Rd., Dallas, Tex., **$78,669**, est. $60,000, base and surf. 2.903 mi. Hy. FM 1282, Proj. R 1379-1-1, Grayson Co.***Dave McCollough**, Pittsburg, Tex., **$69,903**, est. $75,000, base and surf. 6.244 mi. Hy. FM 1520 and 1521, Proj. V 1232-3-1, Camp Co.***Cooper & Woodruff**, 1203 Dallas Natl. Bank Bldg., Dallas, Tex., **$181,632**, est. $175,000, base and surf. 15.93 mi. Hy. FM 1262, Proj. R 1336-1-2, Hansford Co.***Dudley R. Cloud & Son Contractors**, 1903 Transit Tower, San Antonio, Tex., **$180,407**, est. $150,000, base and surf. 12.77 mi. Hy. FM 108-77, Proj. R 715-2-1, Gonzales Co.***E. B. Darby & Co.**, Pharr, Tex., **$93,871**, est. $60,000, base and surf. 8.974 mi. Hy. FM 676 and 1427, R 1064-1-3, Hidalgo Co.***Ernest Loyd**, P.O. Box 1120, Fort Worth, Tex., **$80,152**, est. $60,000, base and surf. Hy. FM 934, Proj. S 1499 (1), Hill Co.; **$158,484**, est. $150,000, base and surf. 10.831 mi. Hy. FM 296, V 141-1-1, Dallam Co.***Southern Contrg. Co.**, 1901 Meadowbrook St., Austin, Tex., **$166,901**, est. $150,000, base and surf. 5.562 mi. Hy. FM 523, R 1003-1-7, Brazoria Co.***Harrison Eng. & Constr. Corp.**, 4638 Mill Creek Parkway, Kansas City, Mo., **$520,308**, est. $200,000, c. conc. 3.866 mi. Hy. U. S. 77, Proj. FI 597 (1) and F 595 (19), Cooke Co., TEXAS. State Hy. Comn., Austin, Tex. Bids Feb. 21. CD 2/13, 2/9, 2/5.

LOW BIDDER—BUILDINGS

Naugle-Leck, Inc., 714 Baker Bldg., Minneapolis, Minn. Low Bidder. **$469,751**, general constr. LIBRARY, on St. Paul campus, ST. PAUL, MINN. University of Minnesota, R. S. Callaway, purch. agt., 323 Admin. Bldg., Main Campus, Minneapolis, Minn. Bids Feb. 14. CD 1/24.

Bushboom & Raub, Salina, Kan. Low Bidder. **$456,800**, general constr. APPLIED ARTS BLDG. at Kansas State College, HAYS, KAN. State Bd. Regents, Topeka, Kan. Bids Jan. 31. CD 1/24.

CONTRACTS—HEAVY CONSTRUCTION

Missouri Pacific R. R. Co., R. P. Hart, ch. engr., Missouri Pacific Bldg., St. Louis, Mo. Owner Builds. **$324,250**, install radio sys. for main lines incl. 137 diesel locomotives and 102 cabooses, MISSOURI.

Reno Constr. Co., Overland Park, Kan. Contract Awarded. **$187,074**, base double asph. surf. tr. 8.777 mi. Proj. 196-40 F 046-1 (1), Harvey Co., KANSAS. State Hy. Comn., Newton, Kan. Bids Feb. 9. CD 1/26.

CONTRACTS—BUILDINGS

Knutson Constr. Co., 3000 E. Hennepin Ave., Minneapolis, Minn. Contract Awarded. **$481,300**, general constr. 1 story, irregular shape SCHOOL, 10025 Penn Ave. S. BLOOMINGTON (MINNEAPOLIS P.O.), MINN. Bd. Educ., E. B. Chadwick, clk., Bloomington, Minn. Bids Feb. 8. CD 1/17.

Collins Constr. Co., 15 W. 10 St., Kansas City, Mo. Contract Awarded. **$750,000**. 150,000 sq. ft. WAREHOUSE and OFFICE, Fiberglas and Fureston Rds., Fairfax Independent Dist., KANSAS CITY, KAN. Consolidated Grocers Corp., Lee Foods Div., 20 and Wyandotte Sts., Kansas City 8, Mo. Awarded Feb. 15.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

† **California**—B.A. 3/27—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., earthwork, pipe line and structures, including reservoirs and pumping plants, laterals 124.5E,

127.7E and 130.4E and sublaterals unit 3, Southern San Joaquin Municipal Utility Dist., Friant-Kern Canal Distribution System, Central Valley Proj., vicinity of Delano, Spec. DC-3327; adv. ENR 3/8.

† **California**—B.A. 3/27—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., furnishing precast rein.-con. pipe for Southern San Joaquin Municipal Utility Dist., Unit 3, Friant-Kern Canal Distribution System, Central Valley Proj., Spec. DS-3328; adv. ENR 3/8.

LOW BIDDERS—HEAVY CONSTRUCTION

Structon, 962 N. La Cienega St., Los Angeles, Calif. Low Bidder. **$319,787**, two 45,000 sq. ft. aircraft hangars, LOS ANGELES, CALIF. Dpt. Airport, 5800 Avion Dr., Los Angeles, Calif. Bids Feb. 16.

Valley Constr. Co., 257 W. Arrow Blvd., Fontana, Calif., Low Bidder, **$304,460**, Site A; **Dowd-Halfer Co.**, 174 S. Sierra Ave., Fontana, Calif., **$502,995**, Sites B and C, ELEMENTARY SCHOOLS, FONTANA, CALIF. Fontana Elementary School Dist., Arrow Hy. and Mango Sts., Fontana, Calif. Bids Feb. 13. CD 1/19.

CONTRACTS—BUILDINGS

H. C. Smith Co., 718 E. 16 St., Los Angeles, Calif. Contract Awarded. Approx. **$500,000**, rein.-con. food processing PLANT, BANDINI, CALIF. Preston Construction Div., Safeway Stores, 672 W. Washington St., Los Angeles, Calif.

Wm. Simpson Constr. Co., 816 W. 5 St., Los Angeles, Calif. Contract Awarded, **$145,000**, rein.-con. GARAGE, BEVERLY HILLS, CALIF. J. W. Robinson Co., 600 W. 7 St., Los Angeles, Calif. Pereria & Metcham, 7421 Beverly Blvd., Los Angeles, archts.

Horn & Steinmen, 10248 Paramount Blvd., Downey, Calif., Contract Awarded, **$832,200**, 108 frame, stucco DWELLINGS, Dune, Elmcroft and Fairford Sts., NORWALK, CALIF. Southern Land Co., 86350 Otis St., South Gate, Calif. John Hollingsworth, 1355 Westwood Blvd., Los Angeles, Calif., archt.

Wagner Constr. Co., 331½ S. Robertson Blvd., Los Angeles, Calif. Contract Awarded, **$500,000**, 65 frame DWELLINGS, 166 St. and Crenshaw Blvd., TORRANCE, CALIF. El Camino Homes, 331½ S. Robertson St., Los Angeles, Calif. CD 12/6.

CANADA

BIDS ASKED—HEAVY CONSTRUCTION

N. B., St. Andress—B.A. 3/14—Secy. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., road, grading retaining wall, etc. Atlantic Biological Station. Approx. $75,000. Plans deposit $15. R. Blais, c/o owner, engr.

Que., Quebec City—B.A. 3/15—Canadian National Rys., E. R. Logie, engr., Union Station, Toronto, Ont., subway under C.N.R. tracks at 4 Ave., elevated sidewalks and concrete work etc. Approx. $375,000. Plans deposit $50.

▲ **B. C., Vancouver**—B.A. 3/19—Ronald Thompson, city clk., City Hall, Sect. 1, Granville St. Bridge about 1773 ft. long, between centers of piers, about 103 ft. wide, etc. $5,000,000. Plans deposit $500. Maj. J. R. Grant, c/o J. C. Oliver, engr., City Hall, Vancouver, B. C. Extended date. CD 12/11.

BIDS ASKED—BUILDINGS

Ont., Morrisburg—SCHOOL—B.A. 3/19—M. A. Campbell, secy. Morrisburg Public School Bd., Morrisburg, concrete, cinder block, school. Approx. $325,000. Plans deposit $50. H. H. Roberts, Westport, archt. CD 10/3.

LOW BIDDERS—BUILDINGS

Argus Robertson, Ltd., 5035 Western Ave., Montreal, Que. Low Bidder. Approx. **$500,000**, 2 story, 70x300 ft., brick, concrete block SCHOOL, ST. EUSTACHE SUR LE LAC, QUE. Protestant School Bd., W. W. Woodwark, secy., St. Eustache sur le Lac, Que. A. L. Perry, 1434 St. Catherine St. W., Montreal, Que., archt. R. Fortin, 3581 Northcliffe Ave., Montreal, Que., engr.

CONTRACTS—BUILDINGS

Bennett & White Constr. Co. Ltd., 660 Howe St., Vancouver, B. C. Contract Awarded. **$936,746**, three 2 story rein.-con. 100-bed HOSPITAL UNITS at Mental Hospital, NEW WESTMINISTER, B. C., Province of B. C., Parliament Bldg., Victoria, B. C. Bids Jan. 15, awarded Feb. 15. CD 1/23, under LB.

Brown Boveri (Canada) Ltd., 1111 Beaver Hall Hill, Montreal, Que. Contract Awarded. **$707,810**, steam generating PLANT exten. 25,000 kw steam turbine unit, WINNIPEG, MAN. Winnipeg Hydro-Electric System, 55 Princess St., Winnipeg, Man. Awarded Feb. 17. CD 10/9.

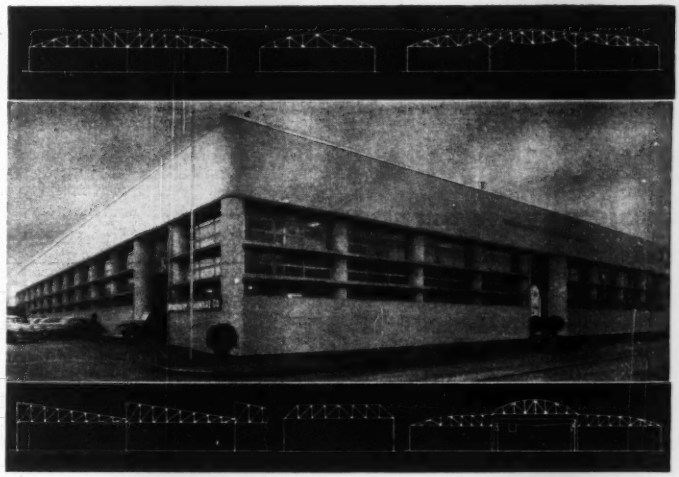
▲ **Desoudy Constr. Ltd.**, 143 North St., Cowansville, Que. Contract Awarded. Approx. **$1,000,000**, rein.-con. spinning PLANT addn., Woodward Ave., SHERBROOKE, QUE. Bruck Mills Ltd., Cowansville, Que. Bids Feb. 15. CD 2/5.

PROPOSED PROJECTS

WATER SUPPLY

▲ **Ga., Marietta**—Cobb Co., Marietta, WW imprvs., Proj. 9-P-1068, **$2,619,000**. Merritt & Welker, 206 Roswell St., consult. engrs.

N. C., Henderson—City, Mayor Henry Powell, bond election May 1, 750,000 gal. elevated tank, feeder mains, etc. pump. station, pump. equip. **$825,000**. CD 1/26.



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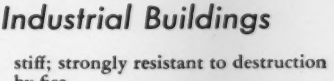

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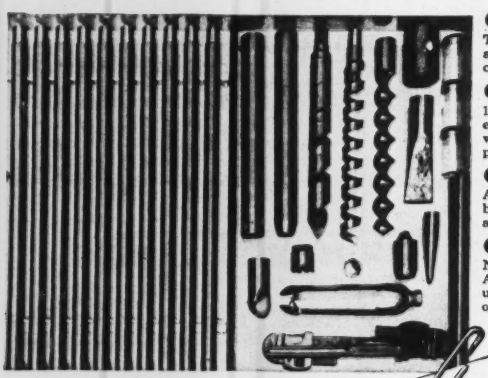

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▲ **Tex., Austin**—City, water plant, 20 m. g. filter on Lake Austin, between Laguna Gloria and Mount Bonnell. $2,000,000. Freese & Nichols, 407 Danciger Bldg., Fort Worth, consult. engrs. CD 11/19.

SEWERS, WASTE DISPOSAL

O., Delphos—City, Irvin Hanf, service dir., sewerage sys. revision and installing pump. stations. $668,000. Floyd Browne & Assoc., Marion, consult. engrs.

Wash., Bryn Mawr—Bryn Mawr-Lakeridge Sewer Dist., Bryn Mawr, bond election Mar. 15, sewerage sys. $547,500. General Eng. Co., Central Bldg., Seattle, Zone 4, consult. engr. General plan approved Nov. 7. CD 10/2.

BRIDGES

▲ **Washington**—State Hy. Dpt., Olympia,
Kings Co.—bridge over Duwamish River at 1 Ave. S., incl. exten. W. Marginal Way, Seattle. $7,000,000. W. A. Bugge, state hy. dir. CD 5/29/45, under Wash., Seattle.

STREETS AND ROADS

N. C., Jacksonville—City, street imprvs. $500,000. Wm. F. Freeman Engineers, High Point, consult. engrs.
Washington—State Hy. Dpt., Olympia,
King Co.—exten. Airport Way to Primary State Hy. 1, south of Seattle. $600,000. W. A. Bugge, state hy. dir.
▲ **Washington**—State Hy. Dpt., Olympia.
Kings Co.—Wall St. and Alaskan Way Connection from Aurora Ave. to Alaskan Way, involving depressed roadway and subway. $2,295,100. W. A. Bugge, state hy. dir. CD 12/2/43, under Wash., Seattle.
▲ **Ont., Toronto**—City, H. E. McCallum, mayor, City Hall, road construction, bridges and culverts and maintenance in 1951, $5,937,651. CD 9/28/43.

EARTHWORK, WATERWAYS

Tex., Houston—Battleship Texas Comn., c/o State of Texas, State Capitol Bldg., Austin, Battleship "Texas" protection, incl. embankment to prevent erosion in vicinity of its berth. $125,000.

AIRPORTS

▲† **Miss., Gulfport**—AIRPORT IMPRVS.—Dpt. Air Force, The Pentagon, Wash. 25, D. C., plans by Harry Inge Johnstone, Annex First National Bank Bldg., Mobile, Ala., administration bldg., 2 hangar renovations, parking aprons, barracks, mess halls at Gulfport Air Force Base, $8,000,000, J. B. Converse & Co., Inc., First Federal Savings Bldg., Mobile, Ala., consult. engr.
▲ **O., Columbus**—AIRPORT IMPRVS.—City, City Hall, airport imprvs., extending 4,500 ft. east-west runway west to 8,000 ft. and misc. paving, $2,238,900; terminal and control tower, convert present terminal into freight depot, $1,300,000; drainage work, $976,400; auxiliary power plant, $407,400; water, sewer and gas lines, $125,000. J. E. Greiner Co., 1201 St. Paul St., Baltimore, Md., consult. engr. CD 6/21/48.
▲† **Tex., Amarillo**—AIR BASE IMPRVS.—U. S. Eng., Box 61, Tulsa, Okla. WW, $1,000,000; construct and pave new roads, $560,000; storm sewerage sys. $1,500,000; sanitary sewerage sys., $750,000; sewage disposal plant, $350,000; open area drainage, grading, $600,000; outside area lighting sys., $450,000; natural gas sys. and main, $800,000; power plant, $750,000, Hasie & Green, Wilson Bldg., Lubbock, consult engrs.; plans by Bentley, Broad & Nelson, engrs. and archts., 228 Reserve Life Bldg., Dallas, maintenance bldg., $523,000, all foregoing at Air Force Base. CD 2/2.
† **Tex., Bryan**—AIRFIELD—U. S. Eng., 1127 Texas and Pacific Bldg., Fort Worth, auxiliary airfield for jet planes. $500,000.
▲ **Tex., Lackland Air Base (Br. San Antonio)**—BARRACKS, etc.—U. S. Eng., 606 Santa Fe Bldg., Galveston, barracks for approx. 12,000 men; $26,000,000; training facilities bldgs. $1,000,000; warehouses, $2,250,000; classrooms, $750,000.

LATIN AMERICA

Mexico—General Manuel Pedrero Valenzuela, c/o Srta. de comunicaciones y Obras Publicas, Mexico City, plans 58 kilometer long railroad. $500,000.

PUBLIC BUILDINGS

Ark., Ft. Smith—SCHOOL—Ft. Smith School Bd., Ft. Smith, Junior High School. $500,000.
Calif., National City—SCHOOL FACILITIES—Sweetwater Union High School Dist., 2800 National Ave., voted $985,000 bonds, school facilities. CD 1/24.
Calif., Santa Maria—SCHOOL FACILITIES—Santa Maria School Dest., Santa Maria, approved, $986,000 bond issue, school facilities. CD 1/30/46.

Conn., New Britain—SCHOOL—City Bd. Educ., 27 Hillside Pl., plans by Warren S. Holmes Co., Lansing, Mich., school, Slater Rd. Section. $550,000. CD 7/10.

Conn., Stamford—SCHOOL—Town, F. W. Bogardus, Jr., Pres. Bd. Educ., plans by Sherwood Mills & Smith, 65 Broad St., brick, steel, concrete school, Vine Rd. $750,000.

Conn., Wethersfield—HIGH SCHOOL—Town, Bd. Educ., Town Hall, plans by Sherwood F. Jeter Jr., 25 Lewis St., Hartford, high school, Walcott Hill Rd. $500,000. CD 2/2.

▲ **Ill., Chicago**—APARTMENT—Chicago Housing Auth., 608 S. Dearborn St., plans by Holabird, Root & Burgee, 180 N. Wabash St., Chicago, Zone 1, 318 unit apartment, at Cottage Grove Ave. and 60 St. $1,600,000. CD 2/2/50.

▲ **Ill., Chicago**—SCHOOLS—City, Bd. Educ., 228 N. LaSalle St., Zone 1, plans by John C. Christensen, 228 N. LaSalle St. Zone 1, Rogers School, 7345 N. Washtenaw St., $640,000; Hale Grade School, 61 St. and Melvina St., $1,000,000; grade school, Lamon and 46 and 47 Sts., Zone 38, $1,200,000. CD 3/28/45.

▲ **Mass., Amherst**—LIBRARY, etc.—State, University of Mass., R. D. Hawley, treas., library addn., $750,000; chemistry laboratory addn., $750,000; food technology laboratory, $300,000; garage and storage bldg., $90,000.

▲ **Mass., Haverhill**—SCHOOL—Regional School Planning Comn., 111 Brockston Ave., regional high school, incl. communities of Haverhill, Groveland, Merrimac and West Newbury, $2,400,000.

▲ **Mass., Norfolk**—PRISON—State, Dpt. Correction, State House, Boston, plans by Desmond & Lord, 6 Beacon St., Boston, 1 story housing for State Prison, Proj. P 104, $6,000,000, R. D. Kimball Co., 6 Beacon St., Boston, consult. engr. CD 9/19.

Mass., Westford—SCHOOL—Town, Peter E. Berry, supt. schools, Main St., elementary school addn., or consolidated school addn. or high school addn., $978,000.

▲ **Mass., Westford**—SCHOOL—Towns of Westford, Littleton and Carlisle, Main St., regional high school, $1,500,000.

Minn., St. James—SCHOOLS—Bd. Educ., A. J. Cole, supt., plans by H. H. Swanson, 500 Saxton Bldg., Minneapolis, 2 school addns. $500,000. CD 1/25/45.

▲ **Minn., St. Paul Park**—SCHOOL—Bd. Educ., Independent School Dist. 102, Washington Co., H. L. Holmes, clk., voted $1,000,000 bonds Feb. 13, school and school addn. Toltz, King & Day, 1509 Pioneer Bldg., St. Paul, archts. CD 10/12/50.

▲ **Mo., St. Louis**—HOUSING—St. Louis Housing Auth., Arthur A. Blumeyer, chn., and Gerald B. Cleary, exec. dir., 901 Washington Ave., Zone 1, plans by Geo. Heilmuth & Assoc., 722 Chestnut St., Zone 1, sixteen 11 story bldgs. and seventy 2 story row houses in area bounded by Dickson St., Jefferson and Cass Aves., and 20 St., Proj. M-5, $15,231,945; fifteen 11 story bldgs. and eighty 2 story row houses between Jefferson Ave., 20 and Dickson Sts. and alley north of Carr St., Proj. M-1-4, part of DeSoto-Carr Proj. $18,778,000. CD 1/9/46.

Mont., Sidney — HOUSING — Richland County Housing Auth., Sidney, plans by J. W. Pahl, Great Falls, housing. $500,000. Central Eng. Corp., Sidney, consult. engrs.

Neb., North Platte—SCHOOLS—Bd. Educ., North Platte, voted $886,000 bonds, schools. Davis & Wilson, 225 Stuart Bldg., Lincoln, archts. CD 2/5.

▲ **N. J., Camden**—HOUSING—Camden Housing Auth., Camden, plans by Edwards & Green, Broadway and Carman Sts., housing, in 3100 block of Westfield Ave. $1,820,000. William T. Harper, 307 Market St., engr. CD 4/14.

N. J., Princeton—HOUSING—Princeton Housing Auth., Princeton, plans by Mathew C. Fleming, 10 Nassau St., housing. $800,000. Harrison Ballord & Allen, 123 E. 77 St., New York, N. Y., assoc. archts. CD 6/30/49.

Pa., Confluence—HIGH SCHOOL—Joint School Dist. of Turkeyfoot Valley, Confluence, plans by C. C. & E. E. Compton, 419 Thompson St., Donora, 1 story, 125x400 ft. brick Junior and Senior High School. $500,000.

Pa., Erie—SCHOOL—School Dist.—Lawrence Twp., Erie, plans by Freeburg & Lindquist, 16 E. 4 St., Jamestown, N. Y. 2 story brick school, Lawrence Twp. $500,000.

▲ **Pa., Phila.**—MENTAL COLONY—Dpt. Welfare, Harrisburg, mental colony of 50 housing units to accommodate 60 patients each, on Quaker Farm Home. $20,000,000.

R. I., Kingston—RANGER HALL—State, State House, Providence, plans by Linwood A. Gardner, 170 Westminster St., Providence, Ranger Hall addn., alterations to cover botany, zoology and marine biology depts. $500,000. CD 9/1/43.

R. I., Providence—DORMITORY—State Bd. Educ., 205 Benefit St., plans by Monahan, Meikle & Johnson, 225 Main St., Pawtucket, dormitory. $650,000. CD 9/25/47.

Tex., Austin—SCHOOLS—Austin Independent School Dist., Austin, plans by Fehr & Granger, 502 E. 5 St., masonry West Austin Junior High School, concrete slab fdn. $750,000; 16-room, brick Highland Park school. $300,000. CD 11/15.

▲ **Tex., Austin**—COURTS and STATE OFFICE—State of Texas, Allen Shivers, gov., Austin, state courts bldg. $2,500,000; state office, $3,500,000. CD 4/28/47.

▲ **Tex., San Antonio**—HOUSING—San Antonio Housing Auth., 419 S. St. Marys St., plans by Ford & Rogers and Sam Zisman, Willow Way, and Weidner & Walther, 609-10-11 Alamo Natl. Bldg., 500 Latin-American Housing Units, Tex. 6-10. $3,650,000. CD 2/14.

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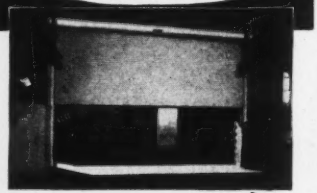

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Wash., Lind—SCHOOL—School Dist. 158, Lind, voted bonds, high school, $540,000. G. M. Rasque & Son, Wash. Trust Bldg., Spokane, archts.

▲ Puerto Rico, San Juan—HOSPITAL—Govt. of Puerto Rico, San Juan, plans by York & Sawyer, 101 Park Ave., New York, N. Y., 500-bed municipal hospital at Borda Farm, on 14 acres, at the end of Loiza St. $7,302,660. CD 9/16/46.

COMMERCIAL BUILDINGS

Calif., Duarte—DWELLINGS—Shumaker-Evans Contractors, 354 S. Spring St., Los Angeles, plans by Wm. M. Bray, 5670 Wilshire Blvd., Los Angeles, 90 frame, stucco dwellings in Delford, Manor Tract, $630,000.

Colo., Colorado Springs—Y.M.C.A. BLDG.—Colorado Springs Y.M.C.A., 206 E. Bijou St., 4 story, brick Y.M.C.A. Bldg. addn. $500,000. Thomas & Sweet, 224 Colorado Springs Natl. Bank Bldg., Colorado Springs, engrs. and archts.

▲ Conn., New Britain—Y.M.C.A. BLDG.—Y.M.C.A., 6 Court St., plans by Moore & Salisbury, 10 N. Main St., West Hartford, and Delbert K. Perry, 17 Court St., Y.M.C.A. Bldg., High St. $1,200,000. CD 2/6.

Ill., Chicago—SHOPPING CENTER, etc.—P. G. Maniates, agent. Grand and Harlem Sts., Zone 35, plans by Herbert B. Beidler, 952 N. Michigan St., Zone 11, 1 story, shopping and parking center and bus terminal, $550,000.

Ill., Wilmette—APARTMENT—Everett R. Cook, spokesman for Syndicate, 161 E. Erie St., Chicago, 11, plans by Fugard Wilkinson & Burt, 520 N. Michigan Ave., Chicago, Zone 11, 28 unit 7 story, apartment, Sheridan Rd. between 7 and 10 Aves. $600,000.

▲ Ind., Evansville—HOSPITAL—St. Mary's Hospital, 713 First Ave., plans by Maguolo & Quick, 4908 Delmar St., St. Louis, Mo., 5 story, bsmnt., brick, stone, 300 room hospital. $1,000,000.

Ky., Madisonville — CHURCH — First Baptist Church, Madisonville, plans by Wallace & Clemmons, 1911 Division St., Nashville, Tenn., 2 story, brick, concrete block, 50,000 sq. ft. church. $500,000.

▲ Mass., Boston—NURSES HOME—Massachusetts General Hospital, Fruit St., plans by Coolidge, Shepley, Bulfinch & Abbott, 1 Court St., nurses home. $1,500,000. CD 12/27/48, under Public Bldgs.

Mass., Brockton—SCHOOL—St. Edward's R. C. Church, Chancery Office, 1 Lake St., Brighton St., Boston, plans by Wm. B. Colleary, 117 Revere St., Boston, parochial school and convent, tract behind church, E. Main St., $600,000.

▲ N. Y., Brooklyn—HOUSING—Syndicate, c/o Jackie Robinson, 17 E. 63 St., New York, low cost co-operative housing for 500 families to be called Jackie Robinson Garden Apartments, on site bounded by E. 102 St., E. 108 St., Flatland, Tenth Sts. and Avenue W. $4,000,000.

▲ N. Y., Flushing—APARTMENT—B. Shefkowitz, c/o Kavy & Kavovitt, archts., 44 Court St., Brooklyn, Zone 2, 6 story, 210x270 ft. apartment for 180 families, Sanford Ave. near 147 St. $1,278,000.

N. Y., Forest Hills—APARTMENT—Kalikow Constr. Corp., c/o Morris Rotistein & Son, archt., 186 Joralemon St., Brooklyn, Zone 2, 6 story, 94x190 ft. apartment for 61 families, 72 Ave. near 110 St. $555,000.

▲ N. Y., Forest Hills—APARTMENT—Harry L. Osias, 233 Broadway, New York, Zone 7, plans by Oscar I. Silverstone, 153 Pierrepont St., Brooklyn, Zone 2, 4 six story apartments, 67 Rd. west of Yellowstone Blvd. $1,000,000.

N. Y., Jackson Heights—APARTMENT—Harry L. Osias, 233 Broadway, New York, Zone 7, plans by Oscar I. Silverstone, 153 Pierrepont St., Brooklyn, Zone 2, 6 story, 100x200 ft. apartment for 96 families, 35 Ave. between 79 and 80 Sts. $672,000.

N Y., Rego Park—APARTMENT—Harry L. Osias, 233 Broadway, New York, Zone 7, plans by Oscar I. Silverstone, 153 Pierrepont St., Brooklyn, Zone 2, 6 story apartment, 64 Rd. and 102 St. $924,000.

O., Gallipolis—HOSPITAL—Holzer Hospital, Wayne B. Foster, Administrator, Gallipolis, O., plans by Dan A. Carmichael, 5 E. Long St., Columbus, hospital addn. $500,000. CD 9/15.

▲ O., Youngstown—HOSPITAL—St. Elizabeth's Hospital, 1044 Belmont Ave., plans by Schmidt, Garden & Erikson, 104 S. Michigan Ave., Chicago 3, Ill., hospital addn. $2,500,000. CD 3/16.

▲ Tex., Houston—SHOPPING CENTER, etc.—S. M. Adams & Assoc., 4001 Westheimer St., shopping center for areas of Highland Village and Oak Estates, $1,750,000; 20 masonry cedar shake dwellings in new area off Oak Estates, $450,000; 30 masonry, cedar shake, frame dwellings, $600,000.

▲ Tex., Houston—DWELLINGS—P. S. Luttrell, 4331 Ella Blvd., 45 frame, masonry dwellings in new extension of Chantilly Lane, $450,000; 32 frame, masonry dwellings concrete slab fdn. in extension of Oak Forest, $320,000; 40 frame, masonry dwellings, off Martin Dr. etc., $400,000.

▲ Tex., Houston—DWELLINGS—W. W. McMillan, 7948 Harrisburg St., 75 frame, cedar shake, fir framing dwellings, concrete slab fdn., Southbank St., $750,000; 100 cedar shake duplexes, concrete slab fdn., Crestmont St., $1,950,000.

▲ Tex., Pasadena—DWELLINGS—C. O. Beeler Riverside Development Co., 5047 Marietta St., Houston, 10 addnl. dwellings, masonry constr. concrete slab and

pier fdn., $400,000; Proj. 2, 35 masonry dwellings on 1 to 1½ acre site each, $1,400,000; Proj. 3, 45 masonry dwellings, $1,800,000; Proj. 4, 100 frame, cedar shake dwellings, concrete slab fdn., $800,000.

▲ **Ont., Toronto**—RESEARCH, etc.—Ontario Cancer Treatment & Research Foundation, 1123 Bay St., plans by Harold J. Smith, 62 Charles St. E., cancer research and treatment bldg. $2,000,000.

INDUSTRIAL BUILDINGS

Del., Claymont—PLANT EXPANSION—Colorado Fuel & Iron Co., Claymont, steel plant expansion. Approx. $500,000.

Ill., Franklin Park or Bensonville—WAREHOUSE, etc.—Reserve Supply Co., 1529 S. Jefferson St., Chicago, Zone 8, plans by Engineering Systems, Inc., 221 N. LaSalle St., Chicago, Zone 1, warehouse and office, near Manheim Station, $500,000.

Ill., North Chicago—FACTORY—Houdaille Hershey Corp., 1900 Foss Park Ave., factory addn. $640,000. Giffels & Vallet, Marquette Bldg., Detroit, Mich., consult. engrs.

▲ **Ill., Rockford**—PLANT—Sundstrand Machine Tool Corp., plant addn., and constr. plant. $3,377,780.

▲ **La., Baton Rouge**—PLANT—Solvay Process Div. Allied Chemical & Dye Corp., North Baton Rouge, soda ash chemical plant unit, $2,750,000.

▲ **La., Baton Rouge**—PLANT—United States Rubber Co., 1230 6 Ave., New York, N. Y., doubling capacity Bune-N-synthetic rubber plant, $2,000,000.

▲ **N. M., Eunice**—GAS PLANT—Skelly Oil Co., Eunice, natural gas plant revisement and expansion. $1,250,000. CD 4/10/47.

▲ **N. Y., Jackson Heights**—PLANT—Bulova Watch Co., Inc., 62-10 Woodside Ave., Woodside, 3 story watch assembly plant, on 24 acre site bounded by Astoria Blvd. south, 77 St., 25 Ave. and Brooklyn-Queens Expressway east. $3,000,000.

▲ **N. Y., Utica**—PLANT—General Electric Co., River Rd., Schenectady, electronics equipment plant, 1 story, steel frame plant, 2 story office. $15,000,000.

▲ **N. C., Henderson**—MILL—Harriett Cotton Mills, Henderson, plans by J. E. Sirrine Co., Main St., Greenville, S. C., mill addn. $2,000,000.

▲ **Okla., Velma**—REFINERY—Skelly Oil Co., Velma, gas refinery plant enlargement, 57,000,000 cu. ft. capacity. $2,000,000.

▲ **Pa., Sharon**—FACTORY—Sharon Tube Co., Sharon, 1 story 75x600 ft. factory. $3,000,000.

▲ **Tex., Alvin**—PLANT—Phillips Petroleum Co., City Natl. Bank Bldg., Houston, project abandoned, gasoline and recycling plant, near here. $9,500,000. CD 9/22.

▲ **Tex., Beaumont**—PLANT—Kaiser Aluminum & Chemical Corp., Airline Hy., Baton Rouge, La., project abandoned aluminum reduction plant. $70,000,000. CD 1/5.

▲ **Tex., Gregory**—PLANT—Reynolds Metals Co., Lloyd A. Amos, mgr., Hunt Bldg., aluminum reduction plant. $85,000,000. J. Gordon Turnbull, Inc., 2630 Chester St., Cleveland, O., engr. CD 2/7.

▲ **Tex., Houston**—PLANT—Mathieson Chemical Corp., 2nd Natl. Bank Bldg., chemical plant. $1,000,000.

▲ **Tex., Pampa**—PLANT—Cabot Shops, c/o R. A. Baker, Pampa, converting pump jack equip. plant into a gun tube mfg. plant. $1,500,000.

▲ **Wash., Longview**—PLANT—Harvey Machine Co., 19200 S. Western St., Torrance, Calif., bauxite reduction plant. $15,000,000.

▲ **Ont., Hamilton**—PLANT—Noranda Mines Ltd., Royal Bank Bldg., Toronto, plant for production of sulphur. Approx. $4,000,000.

▲ **Sask., Regina**—WAREHOUSE DEPOT—Ford Motor Co. of Canada Ltd., Geo. H. Bates, genl. mgr., Windsor, Ont., new parts and accessories warehouse depot. Approx. $1,000,000.

UNCLASSIFIED

▲ **Missouri**—RURAL DISTRIBUTION LINES—Inter-County Electric Co-operative, Licking, 734 mi. rural distr. lines, 36 mi. conversion, communication equip. in Texas Co., $1,480,000, Frank Horton & Co., Lamar, consult. engrs. CD 2/7.

▲ **Montana**—TELEPHONE LINES—Northeastern Montana Rural Telephone Corp., Medicine Lake, Mont., telephone lines for 1,675 customers, in Valley, Sheridan, Daniels, Roosevelt, Divide and McCone Counties, $1,500,000. Central Eng. Corp., Sidney, Mont., consult. engrs.

O., Girard—SCRAP YARD—Columbia Iron & Metals, Inc., 6600 Grant St., Cleveland, scrap yard, near here. $500,000.

▲ **Tex., Dallas**—PARKING STATION—Syndicate, c/o Charles C. Ford, City Hall, Main and Harwood Sts., self parking automobile parking station, 47 acre tract between Union Terminal and Industrial Blvd. $1,000,000. M. R. Springer, city plan engr. (consultant only).

▲ **Alberta and Quebec**—GAS PIPE LINE—Trans Canada Pipe Lines Co., Ltd., c/o Hon. Senator Paul Bouffard, The Senate, Ottawa, Ont., 2,200 mi. gas pipe line from Drumheller, Alta., to Montreal, Que. $250,000,000.

▲ **Ontario**—PIPE LINE—Imperial Oil Ltd., 56 Church St., Toronto, pipe line to tote finished petroleum products from Sarnia to Toronto. Approx. $1,000,000. CD 12/5.

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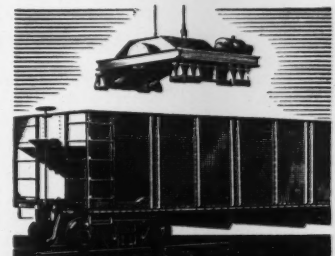

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CONSTRUCTION REPORTS-Second Section

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS
STREETS AND ROADS
March 13
Massachusetts

Conn., Middletown—B. A. About 3/16—Middlesex Hospital, H. H. Lyman, chn., 128x144 ft., brick, concrete hospital addn., Crescent St. $900,000. McKim Mead & White, 101 Park Ave., New York, N. Y., engrs. CD 12/1/47.

BIDS ASKED—BUILDINGS

▲ **Mass., Andover**—SCHOOLS—B.A. 3/15—Town, Supt. Schools, Central School, Bartlet St., $750,000; West Andover School, Beacon St., $350,000. Plans deposit $25 each. CD 9/13.

Mass., Lowell—HOSPITAL—B.A. 3/15—Lowell General Hospital, 295 Varnum Ave., Maternity and Pediatric bldg. at hospital, Varnum Ave. $800,000. CD 12/9/48.

Conn., Fairfield—SCHOOL—B.A. 3/16—Town Bd. Educ., McKinley School, Knapps Hy. $750,000. Plans deposit $50. CD 3/20.

LOW BIDDERS—HEAVY CONSTRUCTION

▲ **Ralph Civitarese**, 193 Providence St., Hyde Park, Mass. Low Bidder. $2,390,900. water sys. imprvs., 8- to 24-in. c.i. mains, fittings in Chicopee, Chicopee Falls and Fairview. CHICOPEE, MASS. City, City Hall, Chicopee, Mass. Bids Feb. 17. CD 2/12.

LOW BIDDERS—BUILDINGS

▲ **O. D. Purington Co., Inc.**, 171 Westminister St., Providence, R. I. Low Bidder, $1,424,000, HIGH SCHOOL, SOUTH KINGSTON, R. I. Town, School Bldg. Comm., South Kingston, R. I. Bids Feb. 20. CD 2/7.

CONTRACTS—BUILDINGS

▲ **The Austin Co.**, 19 Rector St., New York, N. Y. Contract Awarded. $1,200,000. design and construct STORE alterations, 384-400 Washington St., BOSTON, MASS. Equitable Life Assurance Society, 82 Devonshire St., Boston, Mass.

▲ **Volpe Constr. Co.**, 54 Eastern Ave., Malden, Mass. Contract Awarded. $1,057,342. HIGH SCHOOL, WEST BRIDGEWATER, MASS. Town, Supt. Schools, West Bridgewater, Mass. CD 1/29, under L. B.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS
STREETS AND ROADS
March 20
New Jersey

▲ **Del., Wilmington**—B.A. 3/13—City, Street & Sewer Dpt., City Hall, sewage pump. station. $1,000,000. Extended date. Whitman Requardt Assocs., 1304 St. Paul St., Baltimore, Md., engrs. CD 1/29.

† **New York and New Jersey**—B.A. 3/13—U. S. Eng., 80 Lafayette St., New York 13, N. Y., maintenance dredging, in channel north of Shooters Island, part of New York and New Jersey Channels, at eastern end of Arthur Kill and southern part of Newark Bay, the New York and New Jersey Channels project extends from Lower New York Bay through Arthur Kill and Kill Van Kull around Western and northern sides of Staten Island into Upper New York Bay, Serial No. CIVENG 30-075-51-66. CD 10/15/45.

N. Y., Idlewild—FUEL STORAGE—B.A. 3/14—At office Chief Engineer of Port of New York Auth., 111 8th Ave., New York, Zone 11, expansion of fuel storage facilities, Phase II, Contr. NYA-120.001. Plans deposit $30. CD 4/27/44.

▲ **Pa., Phila.**—ORE HANDLING FACILITIES—B.A. About 3/19—Pennsylvania R. R., J. L. Gressitt, ch. engr., Broad St. Station Bldg., 1617 Pennsylvania Blvd., ore handling facilities, Greenwich Piers. Approx. $10,000,000.

BIDS ASKED—BUILDINGS

▲ **N. Y., Glen Cove**—HIGH SCHOOL—B.A. 3/13—Bd. Educ., Union Free School Dist. 15, Junior High School, Forest Ave., Junior High School addn., alterations. $1,000,000.

▲ **N. J., Morrison**—HOUSING—B.A. 3/14—Morristown Housing Auth., Municipal Bldg., Pocahontas Lake Low-Rental Housing. $1,000,000. Kelly & Gruzen, 80 Fifth Ave., New York, N. Y., archts. and engrs. CD 6/27.

▲ **N. J., Trenton**—HOUSING—B.A. 3/14—Trenton Housing Auth., 875 New Willow St., 102 unit housing, John Fitch Way and Union St. $1,000,000. Mickelwright & Mountford, 72 Ewing St., archts. CD 1/26, under LB.

N. Y., New York—NURSES SCHOOL, etc.—B.A. 3/14—Dpt. P. Wks., Municipal Bldg., Zone 7, Contr. 1, demolition, general constr. work, elevators and dumbwaiters, metal equip., top soiling and planting; Contr. 2, plumbing and kitchen equip.; Contr. 3, heating, ventilating, air-conditioning, refrigerator work; Contr. 4, electrical and lighting fixtures for the nurses' school and residence, at Bellevue Hospital. Plans deposit $50 for Contr. No. 1. $25 each Contrs. 2, 3, and 4. CD 8/20/45.

N. J., Long Branch—HOUSING—B.A. 3/15—Housing Auth., Garfield Court, Long Branch, 46-unit housing, Ellis Ave. between Central and Sea View Aves. H. Irving Brown & James Mancuso, 191 and 252 Broadway, Long Branch, archts. Bids Dec. 15 rejected. CD 11/16.

SOON LETS CONTRACT—BUILDINGS

▲ **Del., Newark**—PLANT, etc.—Chrysler Corp., 405 Lexington Ave., New York, N. Y., soon lets contract superstructure mfg. plant and office. Total $10,000,000. Albert Kahn Associated, Architects & Engineers, Inc., New Center Bldg., Detroit, Mich., engr. and archt. CD 1/12.

LOW BIDDERS—HEAVY CONSTRUCTION

▲ **Easton Pa. Auth.**, City Hall, Easton, Pa., rejected bids Feb. 14, secondary sewage treatment plant, EASTON, PA. Est. $1,567,000. Will re-advertise. CD 2/21, under LB.

▲ **Johnstown Housing Auth.**, Johnstown, Pa. rejected bids Dec. 14, 48 two story, 25x100 ft. brick veneer row type federal HOUSING, JOHNSTOWN, PA. L. B. $3,168,000. CD 1/5, under LB.

CONTRACTS—BUILDINGS

▲ **Stackler & Frank**, c/o Alwin Cassens, Jr., archt., 116-55 Queens Blvd., Forest Hills, N. Y. Owner Builds. Approx. $1,500,000. 240 HOMES to be called Woodbury Gardens, on 40 acre site, Ketchams and Woodbury Rds., HICKSVILLE, N. Y.

▲† **Cauldwell-Wingate Co.**, 101 Park Ave., New York 17, N. Y. Contract Awarded. $19,016,400, est. $20,656,981. Veterans HOSPITAL, First Ave. and 23 St., NEW YORK, N. Y. U. S. Eng., 80 Lafayette St., New York 13, N. Y. Bids Feb. 20. CD 2/26, under LB.

▲ **E. I. du Pont de Nemours & Co., Inc.**, du Pont Bldg., Wilmington, 98, Del. Own Forces. Repauno PLANT EXPANSION, GIBBSTOWN, N. J.

▲ **J. Emil Anderson & Son**, 1809 Balmoral St., Chicago, 40 Ill., Contract Awarded, $1,000,000, WAREHOUSE; **Raymond Concrete Pipe Co.**, 140 Cedar St.,

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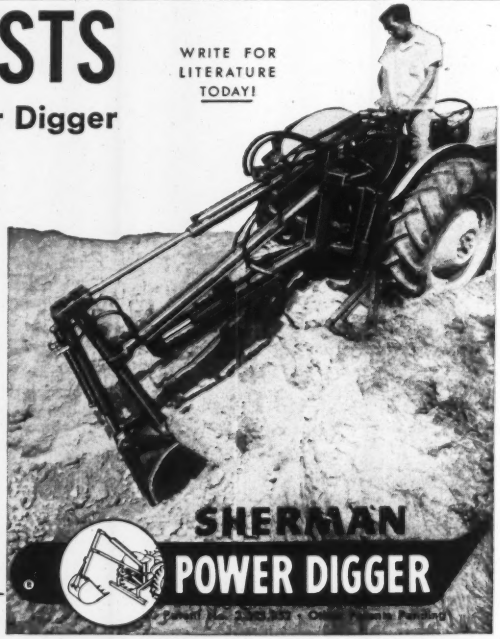

SPECIFICATIONS

Shovel reach below ground surface	8 feet
Digger reach behind tractor	10 feet
Swinging arc	140°
Trench width, standard digging shovel, single cut	18 inches
Digging shovel capacity	3.5 cu. feet
Loading shovel capacity	5 cu. feet
Loading clearance, digging shovel, loaded	7 feet
Loading clearance, loading shovel	10 feet

Standard tractor mounting gives unmatched maneuverability and transportability.

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Digs ditches, trenches, footings, culverts, basements and other excavations.

Works well behind the tractor at any angle.

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Actuated bucket raises high enough to load standard dump truck.

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New York N. Y., foundations and piling for warehouse, GRASSELLI, N. J. E. I. du Pont de Nemours Co., du Pont Bldg., Wilmington, Del. Arthur M. Heda, 1809 Balmoral St., Chicago, Zone 40, archt.

▲ **Joseph Bryant Constr. Co.**, North Arlington, N. J., Contract Awarded, $4,000,000. metal PLANT, RIVERTON, N. J. Hoeganaes Sponge Iron & Metal Powder Corp., 545 Fifth Ave., New York, N. Y.

▲ **Consolidated Eng. Co.**, 20 E. Franklin St., Baltimore, Md. Contract Awarded. Est. $4,000,000. 1 story, brick, concrete, steel mfg. PLANT, 2 story, office, 3 story test laboratory, at Friendship Airport, BALTIMORE, MD. Westinghouse Electric Corp., Maloney Bldg., 337 Blvd. of Allies, Pittsburgh, Pa. CD 11/27.

George Hyman Constr., Co., 1010 Vermont Ave., Wash., D. C. Contract Awarded. $860,200, est. $800,000. 4 story, rein.-con. face brick, limestone, PHYSICS BLDG., COLLEGE PARK, MD. University of Md., College Park, Md. Bids Feb. 1. CD 2/13, under LB.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES

March 13	March 21
South Carolina	Louisiana

STREETS AND ROADS

March 13	March 21
South Carolina	Louisiana

W. Va., Dunbar—B.A. 3/15—Bridge Comn. of City of Dunbar, City Hall, steel superstructure consisting of two 225 ft., one 450 ft. truss span and one 198 ft. two span continuous girder all complete with handrail, flooring and lighting; substructure, concrete abutments, piers and approaches. C. P. Fortney, 206 Union Bldg., Charleston, consult. engr. CD 8/3.

BIDS ASKED—BUILDINGS

▲ **Ala., Birmingham**—HOUSING—B.A. About 3/15—Birmingham Housing Auth., 600 N. 24 St., 500 unit housing Project 2. Approx. $3,000,000. Chas. H. McCauley, Jackson Bldg., archts. CD 8/11.

Va., Bristol—SCHOOL—B.A. 3/15—City, high school. $600,000. Extended date. CD 2/9.

▲ **Tenn., Millington**—HOUSING—B.A. 3/19—Capt. W. T. Eckberg, dist. publ. wks. officer, P. O. Box 365, Navy Dpt. Dist. Pub. Wks. Office, Naval Air Base, S. C., construct., finance, manage, 540 units housing. $3,000,000—$3,500,000. CD 1/5.

LOW BIDDERS—HEAVY CONSTRUCTION

▲† **F. H. Martell Co.**, 1023 20 St., N. W., Wash., D. C. Low Bidder, $1,061,800, transmitting station, near WOODBRIDGE, VA. U. S. Eng., First and Douglas Sts., Wash., D. C.

▲† **Robert Lee, Inc.**, Manning, S. C. Low Bidder, $1,317,262, est. $1,772,896. dredging, etc. Levve L-8 and Canal, in Palm Beach Co., part of Central and Southern Florida Flood Control Proj., West Palm Beach, FLORIDA. U. S. Eng., 575 Riverside Ave., Jacksonville, Fla. CD 1/24.

▲ **H. E. Wolfe Constr. Co.**, St. Augustine, Fla. Low Bidder, $417,096, grading, paving, drainage structures State Rd. 50 between Clermont and the Orange Co. line, Fed. Aid Proj. F-022-2(9), Job. 1107-202, Lake Co.; $577,261, grading, stabilizing, paving, drainage structures, State Road 9 between Dade Co. line and Hollywood Fed. Aid Proj. UI-026-(4), Job 8697-201 Broward Co.***Marion Constr. Co., Ocala, Fla., $492,823, grading, stabilizing, drainage structures, State Rd. Nos. 25 and 500 between Belleview and point approx. 1.6 mi. south of Ocala, Fed. Aid Proj. F 002-2(1), Job 3601-203, Marion Co.*** **Troup Bros. Inc.**, 251 S. Dixie Hy., Miami, $362,268, grading, stabilizing roadbed, paving, drainage structures, State Rd. 5 between Homestead and point approx. 5 mi. north Fed. Aid Proj. F 003-2(1), Dade Co.***L. L. Hall Constr. Co., Orange Park, Fla., $96,544, grading, stabilizing, paving, removing, replacing precast concrete deck slabs the deck of an existing 87 ft. bridge, drainage structures, State Road S-210 between State Road 5 at Durbin and point approx. 5.7 mi. west, Fed. Aid Proj. S-301(1), Job. 7851-250, St. Johns Co.***Cone Bros. Constr. Co., Caesar and Cumberland Sts., Tampa, Fla., $170,651, grading, paving Road 50 between Road 485 and Road 45, State Proj. Job 0805-105, Hernando Co.***S. M. Wall, Gainesville, Fla., $325,814, grading, paving, structures, Roads Nos. 225, 329 and 340 between Roads Nos. 24 and 340, Nos. 23 and 235 and Nos. 225 and 329, State Proj. Jobs. Nos. 2651-150, 2652-150 and 2653-150, Alachua Co., FLORIDA. State Hy. Dpt., Tallahassee, Fla. Bids Feb. 15. CD 2/7.

▲ **City**, City Hall, Miami, Fla., rejected bids Jan. 17, refuse incinerator plant, MIAMI, FLA. L.B. $3,300,000. Will re-advertise. CD 1/25, under LB.

LOW BIDDERS—BUILDINGS

P. S. West Constr. Co., Statesville, N. C. Low Bidder, $824,000. 90,000 sq. ft. Junior HIGH SCHOOL, auditorium, physical educ. bldg., shops, etc., HICKORY, N. C. Hickory City Administrative Units, J. Loy Six, secy., Hickory, N. C. Bids Feb. 15. CD 1/18.

▲ **Byck-Worrell Constr. Co.**, 318 E. Bay St., Savannah, Ga., Low Bidder, $1,463,847, HOUSING, Projs. GA-93 and GA-9-4, BRUNSWICK, GA. Brunswick Housing Auth., Brunswick, Ga. Bids Feb. 20. CD 1/31.

DRAVO HEATERS

*Compared with conventional steam system cost.

Half a million is important money in anybody's language—and it gets more important when it's SAVED instead of spent.

That's just what happened when a leading automobile manufacturer recently built a mammoth new body plant, with over 600,000 sq. ft. of floor space, and with ceiling heights ranging up to 52-feet. Heat requirements, including fresh air tempering provisions, totalled 54,250,000 Btu. Lowest quoted price for a conventional steam boiler plant was $860,000. ACTUAL cost of a complete Dravo *Counterflo* Heater installation of 53 units was $330,000. These direct-fired warm-air heaters take care of all open-space heating requirements of the manufacturing area of the plant.

Bear in mind that these savings involved no compromise with heating effectiveness. The top-flight engineers responsible for selection knew how vital *comfort* is in keeping employes contented and promoting top output. They looked *first* for the finest in heating results . . . and *second* for economies. They found both profitably combined in Dravo Heaters.

Neither did this saving come from "cutting corners" in building the heater, but rather through the basic simplicity of method and equipment. Each of the oil-fired space heaters manufactures heat "on demand" to blanket its own assigned area with warmth. It also introduces fresh, tempered air into the building as needed. Modulating burner controls permit continuous operation and continuous air circulation. This minimizes temperature fluctuation, assures maximum comfort in all weathers, and conserves fuel—for when any section needs LESS heat, its unit burns LESS fuel. Units all have the Underwriters' Laboratories label. They can be converted from oil to gas, should the fuel situation make this desirable.

This spectacular saving has been duplicated on a lesser scale in thousands of smaller plants. If you are concerned with heating any new or old building, you owe it to yourself to find out how Dravo *Counterflo* Heaters are serving and saving for others . . . and how they can save both system costs and operating costs for YOU. Look in the yellow section of your phone book—or write us direct at Dravo Building, Pittsburgh 22, Pa., for Bulletin FH-523-6

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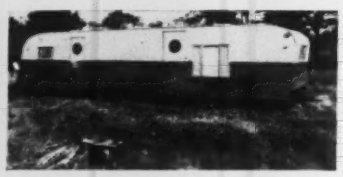

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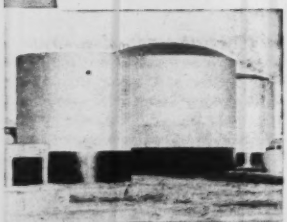

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CONTRACTS—HEAVY CONSTRUCTION

Troup Bros., Inc., 4151 S. Dixie Hy., Miami, Fla. Contract Awarded, $998,179. East-West Runway, runway extens. and taxiways, Miami International Airport, MIAMI, FLA. Dade Co., Court House, Miami Fla. Bids Feb. 1. CD 2/8, under LB.

▲ Latex Constr. Co. of Georgia, 4911 Old Peachtree Rd., Atlanta, Ga. Contract Awarded. $1,500,000. enlargement pump stations at Baton Rouge, La., Collins, Miss., Akron and Silver Run, Ala. Bremen and Center, Ga., and Spartanburg, S. C.; also enlarging terminals to handle increased volume at all mainline points between Baton Rouge and Charlotte, LOUISIANA, MISSISSIPPI, ALABAMA, GEORGIA, SOUTH CAROLINA AND NORTH CAROLINA, Plantation Pipe Line Co. (Standard Oil Co. of New Jersey, Standard Oil Co. of Kentucky and Shell Oil Co.), Healey Bldg., Atlanta, Ga. Bids Feb. 15. CD 2/16.

▲† T. L. James & Co., Ruston, La. Contract Awarded. $2,000,000. addnl. concrete apron facilities at Barksdale Air Force Base, SHREVEPORT, LA. U. S. Eng., 300 Broadway, Little Rock, Ark. Awarded Feb. 16. CD 2/7.

CONTRACTS—BUILDINGS

▲ E. I. du Pont de Nemours Co., Inc., du Pont Bldg., Wilmington 98, Del. Own forces. Commercial explosives PLANT on site approx. 1,500 acres on Potomac River about 8 mi. from MARTINSBURG, W. VA.

Grannis & Sloan & York, Box 3006, Fayetteville, N. C. Contract Awarded. $930,680, 150 units HOUSING, Projects N C 2-3 and N C 2-4, RALEIGH, N. C. Raleigh Housing Auth., Halifax Court, Raleigh, N. C. Bids Feb. 15. CD 2/8.

Ralph W. Didschuneit, Candler Bldg., Atlanta, Ga. Contract Awarded. $945,597. HOSPITAL addn., ATLANTA, GA. St. Joseph Infirmary, c/o Abreu & Robeson, archts., 22 Marietta St., Bldg., Atlanta, Ga. Bids Feb. 21. CD 2/16.

▲ Brunswick Pulp & Paper Co., Brunswick, Ga. Owner Builds. $5,000,000, exten. PLANT for increasing production, BRUNSWICK, GA. CD 8/17.

▲ Standard Constr. Co., 15 11 St., Columbus, Ga. Contract Awarded. Approx. $5,000,000. ELECTRIC POWER PLANT, BRUNSWICK, GA. Georgia Power Co., Marietta St. N.W., Atlanta, Ga. CD 6/16.

▲ Paul Smith Constr. Co., 310 N. Rome Ave., Tampa, Fla. Contract Awarded. $2,100,000, 250 APARTMENT UNITS, TAMPA, FLA. Tampa Bay Manor, Inc., c/o contractor.

▲ Rust Eng. Co., Exchange Bldg., Birmingham, Ala. Contract Awarded. $4,000,000, mfg. PLANT, FAIR FIELD, ALA. Harbison-Walker Refractories, Farmers Bank Bldg., Pittsburgh, Pa.

▲† T. H. Pearce & Co., Edgewood Circle, Columbus, Ga. Contract Awarded, $1,100,056, rehabilitation BUILDINGS, at FORT McCLELLAN, ALA. U. S. Eng., P.O. Box 1169, Mobile, 7, Ala. Bids Feb. 16.

▲ Rust Eng. Co., Exchange Bldg., Birmingham, Ala. Contract Awarded. $1,500,000. lamp mfg. PLANT, REFORM, ALA. Westinghouse Electric Co., First Natl. Bldg., Pittsburgh, Pa. CD 2/12.

M. T. Reed Constr. Co., P. O. Box 1066, Jackson, Miss. Contract Awarded. $819,333, North Greenwood SCHOOL and Broad Street Elementary High SCHOOL, GREENWOOD, MISS. Greenwood Separate School Dist., Greenwood, Miss. CD 2/8, under LB.

▲ Tri-State Constr. Co., Three Sisters Bldg., Memphis, Tenn. Contract Awarded. Approx. $2,000,000. 50,000 sq. ft., steel, concrete MILL, MEMPHIS, TENN. Kimberly-Clark Corp., N. 2 St., Memphis, Tenn. Hanker & Heyer Commerce Title Bldg., Memphis, Tenn., archts. CD 6/12.

▲† John A. Johnson & Sons, Inc., 303 41 St., Brooklyn, N. Y. Contract Awarded, $1,675,290, construct Y-12 LABORATORY Bldg. 9995, Unit 1, Inv. No. 401-51-14 A, OAK RIDGE, TENN. U. S. Atomic Energy Comn., P. O. Box E, Attention: R. J. Dunbar, Engineering Div., Oak Ridge, Tenn. Bids Feb. 23. CD 1/26.

▲ Heirich Constr. Co., 2100 Allar St., Knoxville, Tenn. Contract Awarded. $5,000,000. SHOPPING CENTER, OAK RIDGE, TENN. Corporation, c/o Henry David Epstein & Co. Inc., Lewis Tower Bldg., Phila. Pa.

▲ W. F. Holt & Sons, 1531 Demonbreun St., Nashville, Tenn. Contract Awarded. Approx. $5,400,000. 600 HOUSING units, Weakley Lane, SMYRNA, TENN. Stone River Homes, Inc., c/o contractor.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

O., Dayton—B.A. 3/15—Dist. Service & Bldgs., George F. Baker, dir., Municipal Bldg., Zone 2, Sect. IV intercetor sewer in bed of Great Miami River and through McCook Field from intersection of Great Miami and Mad Rivers to Triangle Park, approx. 5,000 ft. 60 in. pipe, or as an alternate, 5,000 ft. "V" bottom box sewer 4 ft. 9 in. x 4 ft. deep; 2,400 ft. 42 in. sewer, misc. smaller connecting sewers. Approx. $560,675. Plans deposit $25. CD 1/3, under LB.

BIDS ASKED—BUILDINGS

▲ Wis., Madison—LABORATORY—B.A. 3/14—State Bd. Health, Madison, 4 story, pent house, bsmnt., 95x150 ft., rein.-con., brick State Laboratory of Hygiene, $1,125,000. Plans deposit $30. Roger C. Kirchhoff, Madison, state archt. Brimeyer, Grellinger & Rose, 757 N. Broadway, Milwaukee, Zone 2, engrs. CD 10/28/49.

▲ Mich., Detroit—COLLEGE—B.A. about 3/15—Wayne University, 4841 Cass Ave., 8 story, brick, steel T-shaped medical unit, incl. laboratories, classrooms,

etc. for College of Medicine, $3,000,000, Smith-Hinchman & Grylls, 800 Marquette Bldg.; archts. CD 1/23.

▲ **Mich., Detroit**—HOSPITAL—B.A. About 3/15—Henry Ford Hospital, 2799 W. Grand Blvd., hospital addn. $13,600,000. Voorhees, Walker, Foley & Smith, 101 Park Ave., New York, N. Y., archts. CD 2/27/50.

SOON LETS CONTRACT—BUILDINGS

Mich., Highland Park (Br., Detroit)—HOSPITAL—Highland Park Hospital, Glendale and Lincoln Sts., soon lets contract 3 story, brick, concrete, steel hospital, $600,000. J. E. Stephens, 320 Lafayette St., Detroit, engr. Clair W. Ditchy, 5 W. Larned St., Detroit, archt. CD 1/8/47, under Public Bldgs.

▲ **Mich., Lansing**—PLANT—Oldsmobile Div. General Motors Corp., 1014 Townsend St., soon lets contract 1 story, brick, steel, concrete plant addn., alterations engineer bldg. Smith-Hinchman & Grylls, 800 Marquette Bldg., Detroit, archts. CD 7/11.

LOW BIDDERS—BUILDINGS

▲ **Harvey A. Hanson**, 1851 N. Elston St., Chicago, 41, Ill., Low Bidder, $1,013,000, Ogden SCHOOL, CHICAGO, ILL. City Bd. Educ., 228 N. LaSalle St., Chicago, Ill. Bids Feb. 16.

CONTRACTS—HEAVY CONSTRUCTION

▲ **S. A. Healy**, 6955 S. South Chicago, 37, Ill., Contract Awarded, $1,048,627, storm sewer Fulton St. from Auston to Lockwood to Congress Sts., CHICAGO, ILL. City, City Hall, Chicago, 2, Ill. Awarded Feb. 9. CD 9/25.

CONTRACTS—BUILDINGS

▲† **The Penker Constr. Co.**, 1030 Summer St., Cincinnati, O. Contract Awarded. Est. $2,500,000; proving ground contract repairs at Jefferson Proving Ground; **Wittenberg Constr. Co.**, Louisville, Ky., Hoosier Ordnance Plant at CHARLESTOWN, IND. Dpt. Army, Pentagon Bldg., Wash., D. C. CD 2/14.

▲ **Prince Builders**, 6401 S. Kostner St., Chicago, 29, Ill., Owner builds, $1,200,000, 140 HOMES, Kildare, Kilborn, 75 Sts. and Marquett Blvd., Zone 32, CHICAGO, ILL. Harold E. Anderson, 7915 S. State St., Chicago, 19, Ill., archt. Awarded Feb. 16.

▲ **Poirot Constr. Co.**, 2001 Pershing Rd., Chicago, 9, Ill., Contract Awarded, $1,000,000, 83,000 sq. ft. WAREHOUSE, CHICAGO, ILL. The Great Atlantic & Pacific Tea Co., 4425 W. 44 St., Chicago, ILL. Epstein & Sons Co. 2011 Pershing Rd., Chicago, 9, Ill., archts. Awarded Feb. 9.

▲ **George H. Anderson**, Herrin, Ill. Contract Awarded, $1,200,000, PLANT HERRIN, ILL. Allen Industries, Inc. Sidney J. Allen, pres., Leland St. and G. T. R. R., Detroit, Mich.

▲ **Combustion Engineering-Superheater, Inc.**, 200 Madison Ave., New York, N. Y. Contract Awarded. Total cost $85,000,000, 4 giant BOILERS, JOPPA, ILL. Electric Energy Inc., c/o J. W. McAfee, pres., 135 N. 12 Blvd., St. Louis, 1, Mo.

▲ **United Engineering & Foundry Co.**, 948 Duquesne Way, Pittsburgh, Pa. Contract Awarded, continuous ROLLING MILL for magnesium sheet; **Austin Co.**, 16112 Euclid Ave., Cleveland, O., rehabilitating PLANT and installing equipment, MADISON, ILL. Total est. $26,000,000. Dow Chemical Co., Midland, Mich. CD 2/5.

▲ **Erich Fleischer**, 175 St., Tinley Park, Ill. Contract Awarded, $5,000,000, five hundred 1 story, brick HOMES, PARK FOREST, ILL. American Community Builders, Inc., 105 W. Madison Ave., Chicago, 3, Ill.

▲ **Whitehead & Kales Co.**, 58 Haltiner St., Detroit, Mich. Contract Awarded. $1,017,500. 3 story, brick masonry publishing BUSINESS BLDG. addn., Lafayette Blvd. west, DETROIT, MICH. Detroit News Assn., 622 Lafayette Blvd., Detroit, Mich. Giffel & Vallet, Inc., 100 Marquette Bldg., Detroit, Mich., archts.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES

March 16 Minnesota	September 12 Texas
North Dakota	October 9 Texas
March 20 Texas	October 10 Texas
July 17 Texas	November 13 Texas
July 18 Texas	November 14 Texas
August 14 Texas	December 11 Texas
August 15 Texas	December 12 Texas
September 11 Texas	

STREETS AND ROADS

March 16 Minnesota	September 11 Texas
North Dakota	September 12 Texas
March 20 Texas	October 9 Texas
March 21 Texas	October 10 Texas
July 17 Texas	November 13 Texas
July 18 Texas	November 14 Texas
August 14 Texas	December 11 Texas
August 15 Texas	December 12 Texas

South Dakota—RURAL DISTRIBUTION LINES—B.A. 3/15—West River Electric Co-operative, Wall, const. 546 mi. rural dist. lines and 100 mi. conversion in Pennington, Jackson and Meade Counties. $650,000. Fiahart & Colgan, Rapid City, engrs.

▲ **Tex., Denton**—B.A. 3/15—Texas & Pacific Ry. Co., R. J. Gammie, ch. engr., Texas & Pacific Bldg., Dallas, Zone 2, 8 span, 540 ft. deck plate girder bridge across Denton Creek, 13 mi. south of here. $1,250,000.

BIDS ASKED—BUILDINGS

▲ **Minn., Excelsior**—SCHOOL—B.A. 3/15—Bd. Educ., Independent School Dist. 7, Hennepin and Carver Counties, 2 story high school. $1,500,000. Plans deposit $20. Haxby, Bissell & Belair, 1111 Nicollet Ave., Minneapolis, archts. CD 5/2.

S. D., Redfield—WARD—B.A. 3/15—State Bd Charities & Corrections, Pierre, ward bldg. at school for Feeble Mindness. $550,000. W. J. Dixon, Mitchell, archt. CD 2/21/46, under LB.

▲† **Tex., Amarillo**—ADMINISTRATION, etc.—B.A. 3/15—U. S. Atomic Energy Comn., Joseph R. Turan, Los Alamos, N. M., Proposal A, 24,500 sq. ft. masonry administration bldg., $275,000; Proposal B, transportation shops, utilities, $600,000; Proposal C, new enclosed, insulated steel frame ramps, 6,160 lin. ft., $375,000; Proposal D, 4,456 lin. ft. rehabilitation existing ramps, $250,000, Inv. No. 291-51-80.

Minn., North Mankato (P. O. Mankato)—SCHOOL—B.A. 3/16—Bd. Educ., Mrs. J. E. Wettleson, clk., 2 story, bsmnt. school, $550,000. Plans deposit $15. Pass & Rockey, Mankato, archts.

▲† **N. M., Los Alamos**—BUILDINGS—B.A. 3/20—Atomic Energy Comn., Los Alamos, buildings and facilities, Group 131, Area-TA-16 Proj. J Inv. No. 291-51-78. $1,000,000. Plans deposit $50.

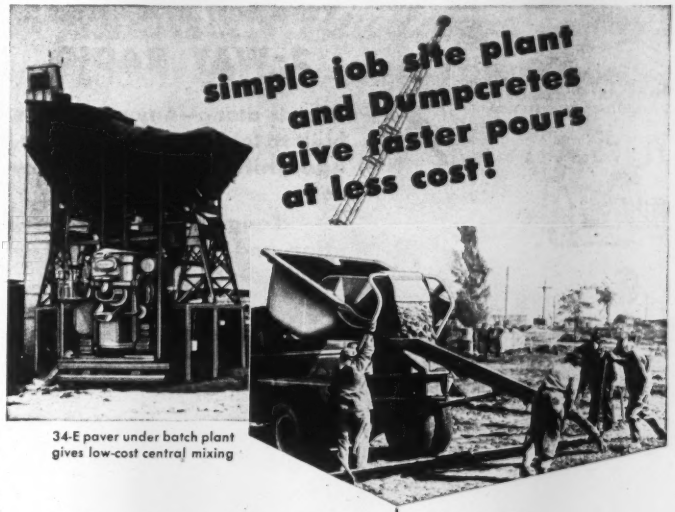
▲ **Tex., Houston**—CHANGE HOUSE, LAUNDRY PLANT, etc.—B.A. 3/20—Ethyl Corp., Natl. Standard Bldg., 100x175 ft. change house and laundry, $300,000; 200x300 ft., masonry, steel central shop and storage, $750,000. Extended date. Goleman & Rolfe, 915 Woodrow St., archts. Bodman & Murrell, Raymond Bldg., Baton Rouge, La., assoc. archts. CD 2/20.

▲ **Tex., Daingerfeld**—INDUSTRIAL FACILITIES—Bids Asked—Lone Star Steel Co., Daingerfeld, Tex., water sys., $550,000; sanitary and storm sewers, $650,000; streets, roads and area paving, $600,000; light plant, lighting sys., $750,000; gas sys., $450,000; drainage sys., $390,000. CD 1/25.

SOON LETS CONTRACT—BUILDINGS

Minn., Minneapolis—HOSPITAL—Fairview Hospital, 2312 S. 6 St., soon lets contract 1 story, bsmnt., 120x159 ft., hospital addn. $600,000. Lang & Raugland, 802 Wesley Temple Bldg., archts. CD 1/24.

Minn., St. Paul—HOSPITAL—St. John's Hospital, 1390 Mounds Blvd., soon lets contract hospital addn. $700,-



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DIVISION

MAXON CONSTRUCTION COMPANY, INC.

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Dayton 2, Ohio

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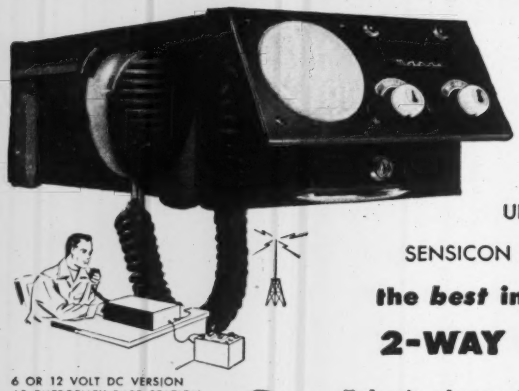

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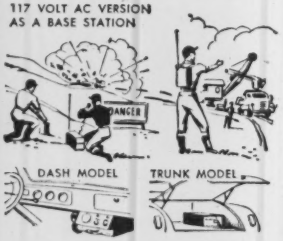

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000. Ellerbe & Co., E. 505 First National Bank Bldg., archts. CD 1/31.

Mo., St. Louis—PLANT—Concordia Publishing House, 3558 S. Jefferson Ave., Zone 18, soon lets contract 3 story, 137-145 ft., rein.-con., brick printing and publishing plant adn., loading dock, sprinkler sys., etc. $750,000. Wischmeyer & Lorenz, Bd. Educ. Bldg., 911 Locust St., Zone 1, archts. CD /12.

Okla., Oklahoma City—WAREHOUSE—Safeway Stores, Inc., Fremont and Howard Sts., San Francisco, Calif., soon lets contract 260x480 ft. warehouse, N.E. 34 and Lincoln Blvd. $500,000. Parr & Aderhold, Hales Bldg., Zone 2, archts. CD 9/30/49.

LOW BIDDERS—HEAVY CONSTRUCTION

▲ **J. V. Gleason & Co.**, 27 and Louisiana Ave., St. Louis Park, Minn. Low Bidder, $103,084, grav. base and plant-mixed bit. surf., 6.4 mi., between Lonsdale, 0.25 mi. west of T. H. 165, Rice Co.***Hallett Constr. Co., Crosby, Minn., $632,877, paving 13 mi. between SAR 9 in. Shelly, 2 mi. north of north limits of Climax, Norman and Polk Counties***Linder & Hohn, Mora, Minn., $207,561, grading bridge 5.2 mi. between Braham and Grasston Isanti and Kanabec Counties***W. Hodgman & Son, Fairmont, Minn., $186,712, grav. base, plant-mixed bit. surf. 12.3 mi. between Redwood Falls and Morgan, Redwood Co.***McCree & Co., 918 New York Bldg., St. Paul, Minn., $202,150, plant-mixed bit. surf. 11 St. southeast Waseca to North Jct. of T.H. 65 in Owantonna, Steele and Waseca Counties***Megarry Bros., St. Cloud, Minn., $164,259, plant-mixed west of Indus and Pelland, Koochiching Co.***Minnesota Valley Imprvt. Co., Granite Falls, Minn., $191,067, Grav. base, road mixed bit. surf. 20.7 mi. between T.H. 12 and Morris, Stevens and Swift Counties, MINNESOTA, State Hy. Dpt., St. Paul, Minn. Bids Feb. 23. CD 2/29.

F. O. Montgomery, Humboldt, Ia. Low Bidder. $860,051, bridges, culverts SN-268, Decatur Co.; $64,451, bridges, culverts, Group 2, S-1303 (2), Monroe Co., IOWA. State Hy. Comn., Ames, Ia. Bids Feb. 20. CD 2/7.

LOW BIDDERS—BUILDINGS

▲ **Dallas Housing Auth.**, City Hall, Dallas, Tex., rejected bids Feb. 6, L. B. $2,845,012. 300 Negro HOUSING units, DALLAS, TEX. (Correction—status). CD 2/15, under CA.

▲ **El Paso Natural as Co.**, Bassett Tower, El Paso, Tex. rejected bids Feb. 16, 18 story OFFICE, EL PASO, TEX. Est. $2,500,000. CD 1/26.

CONTRACTS—HEAVY CONSTRUCTION

▲† **McAlister-Davis Co.**, Pine Bluff, Mo. Contract Awarded. $1,702,450, est. $1,628,750. revetment work at Prichard, New Madrid Bend and Linda, MISSOURI, and Merriwether Bend, TENNESSEE, CIVENG 40-041-51-75. U. S. Eng., Box 97, Memphis, 1, Tenn., Bids Feb. 20. CD 1/11.

▲ **Booth & Olson, Inc.**, 529 Insurance Exchange Bldg., Sioux City, Ia. Contract Awarded. $987,794, paving 19.527 mi. FN-412 Crawford and Sac Counties; $414,212, paving 8.459 mi. FN-986A, O'Brien Co.; $664,167, paving 12.049 mi. FN-554, Pottwattamie Co.*** Fred Carlson Co., Decorah, Ia., $373,515, 6.641 mi. FN-888 and FN-139, Hancock Co.***Centra Constr. Co., Indianola, Ia., $86,449, paving 1.456 mi. FN-966 Hamilton Co.***Mark Eischied Constr. Co., New Hampton, Ia., $380,767, base and bit. 13.18 mi. FN-775, Cerro Gordo Co.***Hargrave Constr Co., 2424 Bever St. S.E., Cedar Rapids, Ia., $399,876, base and bit. 14.944 FN-892, Hancock Co., IOWA. State Hy. Comn., Ames, Ia. Grand total $3,306,771. Bids Feb. 20. CD 2/7.

▲ **Farnsworth & Chambers**, Box 74, Houston, Tex. Contract Awarded. $1,872,000. bridge across portion San Jacinto Reservoir, Atascocita Rd., HOUSTON, TEX. Harris Co., Court House, Houston, Tex. Bids Jan. 22, awarded Feb. 26. CD 2/14, under LB.

▲ **Farnsworth & Chambers**, Box 74, Houston, Tex. Contract Awarded. $1,628,000. construction and paving Atascocita Rd., HOUSTON, TEX. Harris Co., Court House, Houston, Tex. Bids Jan. 22, awarded Feb. 26. CD 2/14, under LB.

▲ **Brown & Root, Inc.**, Box 3, Houston, Tex. Contract Awarded. $1,995,508, city-wide street paving, McALLEN, TEX. City, McAllen, Tex. Bids Feb. 5, awarded Feb. 21. CD 2/14, under LB.

▲ † **Mex-Tex Constr. Co.**, Roswell, N. M. Contract Awarded. $1,895,000, airport imprvs., Walker Air Force Base, ROSWELL, N. M. U. S. Eng., P. O. Box 1538, Albuquerque, N. M. Bids Feb. 8, awarded Feb. 21. CD 1/25.

CONTRACTS—BUILDINGS

▲ **Frazier-Davis Constr. Co.**, 1319 Macklind Ave., St. Louis 10, Mo. Contract Awarded. $1,500,000. 2 story, bsmnt., rein.-con., brick steel OFFICE on site 450x850 ft. Maryland Ave. between Gay Ave. and Topton Way, CLAYTON (ST. LOUIS 5, P.O.), MO. Brown Shoe Co., 1600 Washington Ave., St. Louis 3, Mo. CD 1/3.

▲ **Jayhawk Constr. Co.**, 812 Adams St., Topeka, Kan. Owner Builds. $1,500,000. HOUSING, TOPEKA, KAN.

D. C. Bass & Sons, Bass Bldg., Enid, Okla. Contract Awarded. $943,211. 4 story HOSPITAL adn., ENID, OKLA. St. Marys Hospital, Enid, Okla. Bids Jan. 11, awarded Feb. 14. CD 1/23, under LB.

▲ **Missouri Valley Constructors**, Amarillo, Tex. Contract Awarded. Approx. $2,000,000. 100x110 ft. steel frame, insulated steel panels, rein.-conc. bsmnt. POWER STATION, ERATH, TEX. Southwestern Public

Service, c/o Bill Gilstrap, 5 and Polk Sts., Erath, Tex.

▲ **Stearns-Roger Mfg. Co.,** City Natl. Bank Bldg., Houston, Tex. Contract Awarded. $1,000,000. doubling capacity carbon black PLANT, now under constr., near HOUSTON, TEX. J. M. Huber Corp., Oil & Gas Bldg., Houston, Tex. CD 2/23.

▲ **Gasoline Plant Constr. Co.,** N. Esperson Bldg., Houston, Tex. Contract Awarded. Approx. $2,575,000. 70,000,000 cu. ft. per day cycling PLANT expansion, McALLEN, TEX. Taylor Rening Co. & Mayfair Minerals, Inc., McAllen, Tex. CD 11/15.

C. O. Beeler Riverside Development Co., 5047 Marietta St., Houston, Tex. Own Forces. $940,000. Proj. 1, 118 DWELLINGS, PASADENA, TEX. CD 2/23.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES

March 22
California

STREETS AND ROADS

March 21
California

March 22
California

† **California**—B.A. 3/20—U. S. Eng., 751 S. Figueroa St., Los Angeles, San Diego River and Mission Bay Imprvt., San Diego, San Diego Co., CIVENG 04-353-51-22. Approx. $500,000.

LOW BIDDERS—HEAVY CONSTRUCTION

▲ **Griffith Co.,** 1060 S. Broadway, Los Angeles, Calif. Low Bidder. $1,221,641, plant mix surf., rein.-con. bridges 3.8 mi. Chula Vista, San Diego Co., CALIFORNIA. State Div. Hys., 120 S. Spring St., Los Angeles, Calif. CD 1/29.

▲ **Bressi & Bevanda,** 6950 Tujunga Blvd., Los Angeles, Calif., Low Bidder. $1,693,664, est. $2,000,000. Tujunga Wash. Imprvs., Bushy Ave. to Hansen Dr., Los Angeles, Eng. 04-353-51-15, CALIFORNIA. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids Feb. 15. CD 1/24.

▲ **M. H. Hasler Constr. Co. & D. & H. Constr. Co.,** P. O. Box 387, Santa Ana, Calif. Low Bidder. $2,194,484. Mormon Island Auxiliary Dam, Folsom Reservoir Proj., 4 mi. northeast of Folsom, Sacramento Co., Serial No. CIVENG 04-167-51-41, CALIFORNIA. U. S. Eng., 1029 Eighth St., Sacramento, Calif. Bids Feb. 20. CD 1/24.

▲† **Peter Kiewit Sons Co.,** 345 Kieways Ave., Arcadia, Calif. Low Bidder, $2,360,187, est. $2,000,000, Los Angeles River Imprvt. Stewart and Gray Rd. to Imperial Hy., South Gate, Los Angeles Co., CIVENG 04-353-51-13, CALIFORNIA. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids Feb. 20. CD 2/8.

▲† **Drake & Mullen,** 621 9 Ave. N., Seattle, Wash. Low Bidder. $1,690,900. 58 BUILDINGS for 2,400-man section of military camp at Yakima firing range, YAKIMA, WASH. U. S. Eng., 4735 E. Marginal Way, Seattle, 4, Wash. Bids Feb. 23.

C. C. Moore & Co., First and Mission Sts., San Francisco, Calif., Low Bidder, $873,099, steam GENERATING UNIT and AUXILIARY UNITS for Unit 4, municipal power plant, Spec. 501, BURBANK, CALIF. City, City Hall, Burbank, Calif. CD 3/28.

LOW BIDDERS BUILDINGS

▲ **City Bd. P. Wks.,** City Hall, Los Angeles, Calif., rejected bids Feb. 14, city HEALTH and RECEIVING HOSPITAL, L.B. $6,659,000. LOS ANGELES, CALIF. CD 2/16, under LB.

CONTRACTS—HEAVY CONSTRUCTION

A. Teichert & Son, Inc., 1846 37 St., Sacramento, Calif., Contract Awarded, $917,600, plant mix on untreated rock surf. 6.1 mi. between Peralta School and Riverside Co. line, Orante Co., CALIFORNIA State Div. Hys., Sacramento, Calif. Bids Jan. 25, awarded Feb. 24. CD 2/2, under LB.

▲† **Morrison-Knudsen Co., Inc.,** 411 W. 5 St., Los Angeles, Calif. Contract Awarded, $4,500,000, airplane parking areas at Travis Air Force Base, near FAIRFIELD, CALIF. Dpt. Air Force, Pentagon Bldg., Wash., D. C. Awarded Feb. 19. CD 11/17.

CONTRACTS—BUILDINGS

▲ **United Concrete Pipe Corp.,** Baldwin Park, Calif. Own Forces, $1,000,000, concrete pipe mfg. PLANT, MOSES LAKE, WASH. CD 1/11.

▲ **Macdonald Bldg. Co.,** 1517 S. Tacoma Way, Tacoma, Wash. Contract Awarded, $1,072,309, Central LIBRARY addn., TACOMA, WASH. City Library Bd., 1120 S. Tacoma Ave., Tacoma, Wash. Bids Feb. 9. CD 2/16, under LB.

▲ **Engineers Ltd.,** 1723 Webster St., Oakland, Calif. Contract Awarded, $2,101,000, 5 rein.-con. Alameda Co. JUVENILE HALL BLDGS. at Fairmont Hospital, OAKLAND, CALIF. Alameda Co., Court House, Oakland, Calif. Bids Feb. 8, awarded Feb. 9. CD 1/10.

J. A. Wilson, 1135 W. Huntington Dr., Pasadena, Calif., Contract Awarded, $660,000, 44 frame, stucco DWELLINGS in Tract 15136, PASADENA, CALIF. Wilson & Kleefeld, 1135 W. Huntington Dr., Pasadena, Calif.

ALASKA

CONTRACTS—HEAVY CONSTRUCTION

▲† **Boen-Sealand Constructors,** 3647 Stone Way, Seattle, 3, Wash. Contract Awarded $4,659,400, twelve 8-family QUARTERS BLDG. at Ladd Air Force Base and twenty-seven 8-family bldgs. at Eielson Air Force Base, ALASKA. U. S. Eng., (APO 942, c/o PM, Seattle, Wash.), Anchorage, Alaska. Bids Jan. 30. CD 2/6, under LB.

CANADA

SOON LETS CONTRACT—BUILDINGS

B. C., **Burnaby**—HOSPITAL—Mrs. A. H. Short, 3327 Olive Ave., Burnaby Hospital Society, South Burnaby, soon lets contract 4 story, full bsmt., 100-bed 44x193 ft., rein.-con., hospital and 44x90 ft. wing, $900,000. Gardiner & Thornton, 1664 W. Broadway, Vancouver, archts. CD 8/2/49.

LOW BIDDERS—BUILDINGS

▲ **Bennett & White Constr. Co. Ltd.,** 660 Howe St., Vancouver, B. C., Low Bidder $1,099,513, Junior-Senior High SCHOOL and DORMITORY, KAMLOOPS, B. C. School Dist., 24, Kamloops, B. C. Bids Feb. 12. CD 12/3.

CONTRACTS—HEAVY CONSTRUCTION

▲ **H. J. McFarland Constr. Co. Ltd.,** 7 Talbot St., Picton, Ont. Contract Awarded. $1,300,000, runways and landing strips at Uplands Airport, UPLANDS, (Postal Dist. Ottawa) Ont. Govt. of Canada, Hunter Bldg., Ottawa, Ont. Bids Feb. 6. CD 1/9.

▲ **Angus Robertson Ltd.,** 5035 Western Ave., Montreal, Que. Contract Awarded. Approx. $6,500,000, first development of first 100,000 hp. on Manicouagan and Outardes Rivers near Baie Comeau, QUEBEC. Manicouagan Power Co., 580 Sherbrooke St. W., Montreal, Que. Bids Feb. 10. CD 2/6.

FOREIGN

BIDS ASKED—HEAVY CONSTRUCTION

Australia—Snowy Mountains Hydro-Electric Auth., 85 O'Riordan St., Alexandria, New South Wales, receiving bids April 13, for first Snowy River power station of 80,000 h.p. near Mount Kosciusko, incl. 3¼ mi. tunnelling and stipulated completion within 2 years. CD 9/1.

(Proposal Advertisements see pp. 88 to 91)

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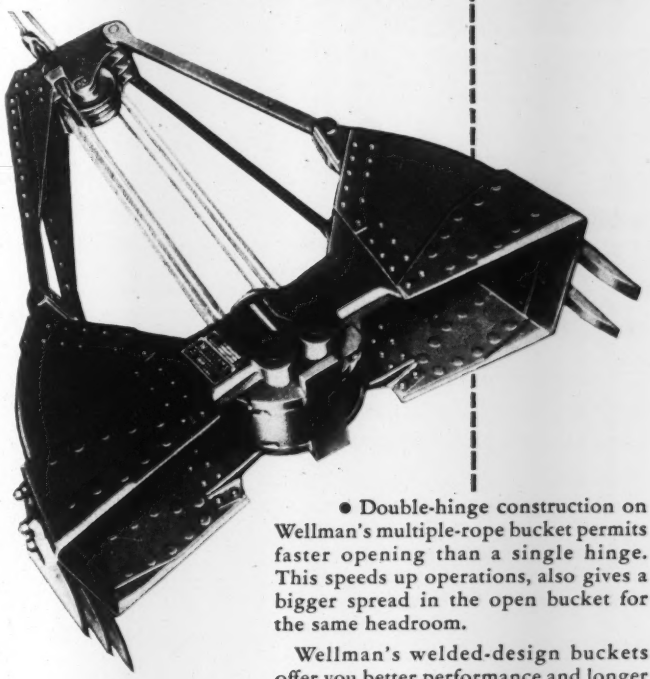

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OFFICIAL PROPOSAL

Bids: March 27, 1951

Sanitary Trunk Line Sewer

Sealed proposals will be received by the City of Stamford, Connecticut at the Office of the Purchasing Agent, Room 1, City Hall, until 2 P.M., E.S.T., Tuesday, March 27, 1951 and then publicly opened and read for furnishing of all plant, labor, materials and equipment and performing all work required for the construction of the following sewers.

Description.

This contract is for the construction of a Trunk Line Sanitary Sewer in the following streets: Canal Street, Atlantic Square, Main Street, Washington Avenue, Woodside Street, Atlantic Street and a Stormwater Sewer in Quintard Place.

Extra strength, full inside diameter, vitrified tile pipe will be required in the following approximate lengths: 36"—4666 Lin. Ft., 30"—308 Lin. Ft., 24"—508 Lin. Ft., 18"—696 Lin. Ft., and 360 Lin. Ft. of 18" extra heavy reinforced Concrete Culvert Pipe, 492 Vert. Ft. of Manhole, replacement of Pavements and all other appurtenant work thereto.

Each Bid must be accompanied with a certified check of the bidder made payable to the City of Stamford or a Bid Bond in an amount not less than 5% of his bid.

Plans and Specifications may be secured at the office of the Purchasing Agent upon the deposit of $25.000 per set, the deposit will be remitted if the Plans and Specifications are returned in good condition not later than 30 days after the opening of the bids.

Additional information may be obtained at the office of the City Engineer, Room 27, City Hall. All Bids will be subject to Section 484.3 of the Charter of the City of Stamford.

WILLIAM P. HEMMING,
Purchasing Agent

Bids: March 14, 1951

Furnishing Linear Feet of Inside of Diameter Pipe

Wanaque, New Jersey
February 28, 1951.

Sealed proposals will be receved from 2:00 P.M. to 2:10 P.M. on March 14, 1951, by the North Jersey District Water Supply Commission in its offices at Wanaque, N. J., and publicly opened and read at the last named hour, for furnishing approximately 24,700 linear feet of 72-inch inside diameter pipe and delivering same in the Boroughs of Wanaque and Pompton Lakes, Passaic County, New Jersey.

A pamphlet containing the information for bidders, form of proposal, form of contract, specifications and drawings may be examined in the office of the Commission or may be obtained at the said office upon deposit of Ten Dollars ($10.00), which deposit will be repaid upon return of the pamphlet within 30 days after award of contract.

All bids shall be made on the blank form supplied by the Commission, which provides for a detailed statement as to the bidder's experience and resources as well as the unit price for which he will execute the work.

Each proposal must be accompanied by an agreement in writing of a surety company qualified to do business in New Jersey, binding itself to indemnify the Commission against any losses due to the failure of the person or persons making said proposal to properly execute the contract in case it be awarded to him or them, and binding itself that if the contract be so awarded the said surety company will become surety for the full and faithful performance of the same in an amount equal to 100 per cent. of the contract price and, through an additional obligation, will also become surety in the sum of 100 per cent. of the contract price, for the protection of all persons furnishing materials or labor for fulfilling this contract in accordance with Revised Statutes of New Jersey 2:60-207 to 211 inclusive.

All bids must be accompanied by a certified check for Fifty Thousand Dollars ($50,000) as a guarantee. Checks of unsuccessful bidders will be returned within 30 days, that of the successful bidder upon the execution of contract and bonds.

The Commission reserves the right to accept any bid deemed advantageous or to reject all proposals or any proposal which may be informal, the acceptance of which, in the judgment of the Commission for the reasons as suggested in information for bidders or for any other reason, would be detrimental to the interests of the municipalities for which the work is to be done.

By order of the NORTH JERSEY DISTRICT WATER SUPPLY COMMISSION OF THE STATE OF NEW JERSEY.

WILLIAM P. FURREY,
Chairman

Attest: George V. McDonough,
Secretary

Bids: March 21, 1951

Rehabilitation of 102nd Street Bridge Approach

THE PORT OF NEW YORK AUTHORITY
LA GUARDIA AIRPORT
CONTRACT LGA-180.035

Sealed proposals for the rehabilitation of the approach to the 102nd St. Bridge at La Guardia Airport will be received in the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111-8th Ave., N. Y. 11, until 2:00 P.M., Wednesday, March 21, 1951, and thereafter in the Auditorium of the Authority at the same address until 2:30 P.M., o'clock on the same date, at which latter time and place said proposals will be publicly opened and read.

Contract documents may be seen at the office of the Chief Engineer and copies will be furnished upon deposit of $25 per set. The deposit will be remitted if the documents are returned in good condition, not later than 30 days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman,
Chairman

New York, March 8, 1951.

Bids: March 15, 1951

Fence Along 19th Avenue

THE PORT OF NEW YORK AUTHORITY
LA GUARDIA AIRPORT
CONTRACT LGA-140.003

Sealed proposals for the construction of a fence along 19th Ave. at La Guardia Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 8th Ave., N. Y. 11, until 11:45 A.M., Thursday, March 15, 1951, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Chief Engineer and copies will be furnished upon deposit of $10 per set. The deposit will be remitted if the documents are returned in good condition, not later than 30 days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman,
Chairman

New York, March 8, 1951.

(Continued on page 89)

CONTRACTORS WATCH THIS SECTION
for New Projects

Publish your announcements thru the "Proposal Section" of Engineering News-Record and get their bids.

U. S. Government
(Continued from page 88)

NEW ORLEANS DISTRICT, CORPS OF ENGINEERS, Foot of Prytania Street, New Orleans, La.—Sealed bids will be received in this office until 11:00 a.m., CST, 21 March 1951, and then publicly opened for construction of spillway, outlet structures, dike and dam closure of Texarkana Dam, Bowie and Cass Counties, Texas, New Orleans District. The principal features involved are approximately 50,000 cubic yards of concrete; 74,000 barrels of cement; 4,290,000 pounds of reinforcing steel; 3,700 lineal feet of drainage relief wells; 70,100 cubic yards of riprap; 3,570,000 cubic yards of excavation; and 2,000,000 cubic yards of compacted embankment. Further information on application. (322)

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-3329) will be received by Bureau of Reclamation, Fort Peck, Montana, until March 29, 1951, and then publicly opened for furnishing labor and materials and performing all work for the installation of overhead ground wires on the Fort Peck-Wolf Point section of Fort Peck-Glendive 115-kilovolt transmission line, Fort Peck Project, Montana. The work will consist of installing 2 overhead ground wires and bayonets on approximately 35 miles of line; and other work. Time allowed for completion will be until May 15, 1952. For particulars, address Bureau of Reclamation, Fort Peck, Montana, or Building 1-A, Denver Federal Center, Denver, Colorado.

Department of Commerce, Bureau of Public Roads, February 23, 1951. SEALED BIDS will be received at the office of the Bureau of Public Roads, Gatlinburg, Tennessee, until 1:30 p.m., E.S.T., March 29, 1951, for the construction of Project 3A5-3C1, Great Smoky Mountains National Park, Sevier and Blount Counties, Tennessee. Grading and Base Course from Park Headquarters to Station 169+00 and from Tremont Intersection to North Park Boundary and Bridge over Fighting Creek. Length 2.391 miles. The approximate quantities of the more important items are 59,350 cu. yd. Excavation, 15,000 tons Crushed Gravel or Crushed Stone Base Course, 350 cu. yd. Cement Concrete and 720 cu. yd. Stone Masonry. Minimum wage rates have been fixed as required by law. For plans and specifications, a deposit of $10 cash or certified check will be required to insure their return within 15 days after opening of bids. Plans, specifications and proposal forms may be obtained from the office of the Division Engineer, 1440 Columbia Pike, Arlington, Virginia, or from the address given above. H. J. Spelman, Division Engineer.

OFFICIAL PROPOSALS

Bids: March 20, 1951

Pumping Station and Storm Water Pumping Facilities

BOROUGH OF TETERBORO,
NEW JERSEY

Sealed bids for the construction of new pumping station at or near the site of the existing pumping station in the Borough of Teterboro of reenforced concrete wet-well and above same construction of a concrete block building approximately 24 feet square and 12 feet high, and the construction of drainage ditch approach aprons and retaining walls of re-enforced concrete will be received by the Mayor and Council of the Borough of Teterboro, New Jersey at 8:20 P. M. on March 20, 1951 in the Council Room at the Municipal Building, Route 6, Teterboro, New Jersey. At this time the sealed bids will be opened and read for consideration of the governing body.

In addition to the foregoing resume the plans and specifications encompass the installation of four new float-actuated electrically-driven centrifugal pumps with motors with aggregated rated capacity at full suction of approximately 35,000 gallons per minute, and an electric energy demand of about 230 horsepower which pumps will be placed in the re-enforced concrete wet-well together with float switches, and other electrical equipment.

Copies of plans, specifications and contract documents may be obtained at the office of the Borough Clerk, Municipal Building, Route 6, Teterboro, New Jersey, upon deposit of $25.00 per set, which shall be refunded only upon the condition that they be returned within thirty days after opening of the bids in good condition and provided that a bona fide bid has been made by the person placing the deposit.

OFFICIAL PROPOSALS

Each proposal must be accompanied by a Surety's written consent and a certified check for not less than 10% of the amount of the bid payable to the Borough of Teterboro.

The form of bid supplied must be used in bidding.

The successful bidder will be required to furnish within ten dyas after award, a surety corporation bond equal to 100% of the contract price in accordance with the form provided by the Borough.

The Borough reserves the right to reject any and all bids, to waive any informalities, or to accept the bid which, in its judgment, best serves the interest of the Borough.

VERA D. BAUM,
Mayor.

ATTEST:
MARGARET J. CAHILL,
Borough Clerk.
Feb. 24—Fees $8.76 (73)

Bids: March 20, 1951

Construction of Route 6A, Section 6

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

ROUTE 6A, SECTION 6

Construction of Route 6A, Section 6, Widening and Resurfacing from Ross Corner to Lafayette, Townships of Frankford and Lafayette, Sussex County.

Roadway Items

Estimated:
13,000 cu. yds. Roadway Excavation—Earth
2,500 cu. yds. Roadway Excavation—Rock
1,500 cu. yds. Borrow Excavation
8,250 tons 4" Waterbound Macadam Base Course
6,300 tons 3" Waterbound Macadam Int. Course
1,970 Pavement Type MA-BC-1

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Tuesday, March 20, 1951, at eleven o'clock (11:00 A.M.—EASTERN STANDARD TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: R. J. Abbott
State Highway Commissioner

Bids: March 27, 1951 (353)

Electrical Equipment

CONTRACT 426

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York City, until 11:00 A.M., Eeastern Standard Time, on Tuesday, March 27, 1951, for Contract 426, for furnishing, installing and testing electrical equipment and conductors and for installing and testing substation equipment furnished by The City and for testing electrical equipment installed under previous contracts, for the sewage treatment plant and for the North Street and Neversink pumping stations which are being built under Contract 381 by The City of New York in the City of Port Jervis, Orange county, New York, all as set forth in the specifications.

No bid will be received and deposited unless accompanied by a certified check upon a National or State bank, drawn and made payable to the order of the Comptroller of the City of New York, in the amount of two thousand dollars ($2000.00), for the proper execution of the contract.

At the above place and time the bids will be publicly opened and read. Pamphlets containing information for bidders, forms of bid and contract, specifications, contract drawings, requirements as to surety, etc., can be obtained at the office of the Chief Engineer, Room 1311, at the above address, upon application in person or by mail, by depositing the sum of five dollars ($5.00) in cash or its equivalent for each pamphlet. Within 30 days following the award of contract or rejection of bids, the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of four dollars ($4.00) will be made for each other pamphlet returned in acceptable condition. Arrangements will be made whereby prospective bidders desiring blueprints of the contract drawings for their own use may secure same, the cost thereof to be paid by them. For further particulars, apply at the office of the Chief Engineer at the above address.

IRVING T. V. A. HUDE, President, RUFUS E. McGAHEN, JAMES J. MORAN, Commissioners, Board of Water Supply; RICHARD H. BURKE, Secretary.

Bids: March 29, 1951 (356)

The Delaware Memorial Bridge

Sealed proposals for Field Painting of all steel and other metalwork except the main cables and suspenders for "The Delaware Memorial Bridge" over the Delaware River near Wilmington, Delaware, will be received by the Delaware State Highway Department at the office of the Director, Delaware Crossing Division, Continental American Building, Wilmington, Delaware, until 12 o'clock Noon, Eastern Standard Time, March 29, 1951, at which time and place said proposals will be publicly opened and read.

Alternate bids will be received as follows:

Field Painting Metalwork—Three Coats, Lump Sum.

Alternate A—Field Painting Metalwork—Two Coats, Lump Sum.

The approximate tonnage of steelwork to receive field coats of paint is 31,900 tons.

Performance of the contract shall begin promptly after execution of the contract and shall be completed on or before November 1, 1951.

Monthly payments will be made for ninety (90) per cent of the painting completed each month.

Bidders must submit proposals upon forms furnished by the Department.

Each proposal must be accompanied by an acceptable surety bond or certified check for a sum equal to at least ten (10) per cent of the total amount of the proposal.

The Contract will be awarded or proposals rejected within thirty (30) days from the date of opening proposals. The right is reserved to reject any or all bids.

The Specifications and other contract documents may be examined at the office of the Director, Delaware Crossing Division and at the office of the Engineers, Howard, Needles, Tammen & Bergendoff, 55 Liberty Street, New York 5, New York. Two copies of the Specifications may be obtained from the Engineers after March 2, 1951 upon payment of $10.00 Any prospective bidder who has made such a deposit may secure blueprint copies of any reference drawings upon payment of 50 cents per drawing and extra copies of the Specifications upon payment of $2.50 per copy. Such payments will not be refunded and contract documents and drawings are not required to be returned.

State Highway Department
J. Gordon Smith, Chairman
W. A. McWilliams, Director
Delaware Crossing Division
Wilmington, Delaware
February 23, 1951

(Continued on page 90)

U. S. Government
(Continued from page 89)

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-3327) will be received by Bureau of Reclamation, Denver, Colorado, until March 27, 1951, and then publicly opened for furnishing labor and materials and performing all work for the construction of earthwork, pipe line, and structures, including reservoirs and pumping plants, laterals 124.5E, 127.7E, and 130.4E and sublaterals, unit 3, Southern San Joaquin Municipal Utility district, Friant-Kern Canal Distribution System, Central Valley Project, California. The work is situated in the vicinity of Delano, California. Principal items are approximately: 260,000 cu. yds., excavation; laying or furnishing and laying 47 mi. of concrete pipe ranging from 12 in. to 48 in. in diameter; installing 465,000 lbs. of pumps and manifolds; and other work. Time allowed for completion will be 450 days. For particulars, address Bureau of Reclamation, Lindsay, California; or Building 1-A, Denver Federal Center, Denver, Colorado.

OFFICIAL PROPOSALS

Bids: April 3, 1951

Sewerage Treatment Plant

ADVERTISEMENT FOR BIDS

1. Sealed peropsals addressed to the Honorable Mayor and City Council of the City of Dallas, Texas, for construction of The proposed WHITE ROCK SEWAGE TREATMENT PLANT, Contract No. 360-B, for the City of Dallas, Texas, hereinafter called "City", in accordance with plans, specifications and contract documents adopted by the City Council of the City of Dallas, Texas, prepared by Powell & Powell, Consulting Engineers, and which may be obtained from the Superintendent of Water Works of the City of Dallas, Water Works Building, 2125 Commerce Street, Dallas, Texas, will be received at the office of the City Secretary of the City of Dallas, Texas, at the City Hall, until 1:30 o'clock p.m. on the 3rd day of April, 1951. Bids will be publicly opened and read aloud at 2:00 o'clock P.M. on the 3rd day of April, 1951, in the Council Chamber by the Mayor and City Council of the City of Dallas, Texas.

Any bids received after the closing time will be returned unopened.

2. Plans and specifications may be examined without charge in the office of the City Secretary or the Superintendent of Water Works, and may be procured from the Superintendent of Water Works at the Water Works Building, 2125 Commerce Street, Dallas, Texas, upon deposit of Twenty-five ($25.00) Dollars as a guaranty of the safe return of the plans and specifications. The full amount of this deposit will be returned to each bidder immediately upon the return of the plans and specifications in good condition. No refund on contract documents and plans returned later than five (5) days after the bids are opened will be obligatory.

3. A cashier's check or acceptable bidder's bond, payable to the City of Dallas, Texas, in an amount of not less than five per cent (5%) of the largest possible total for the bid submitted, must accompany the bid.

4. The City reserves the right to reject any or all bids and to waive any formalities.

HAROLD G. SHANK
City Secretary
Dallas 1, Texas

Bids: April 3, 1951

Collecting Sewer System

Sealed bids will be received by the Commission of Jefferson County, 210 Court House, Birmingham 3, Alabama, at its office until 10:00 A.M., C.S.T., Tuesday, April 3, 1951, and at that time publicly opened and read, for furnishing the pipe and for constructing a collecting sewer system consisting of approximately 16.9 miles of sewers from 8" to 36" in diameter, and which is subdivided into the following contracts.

CONTRACT A—The work under this contract is divided into four sections. Bidders may submit proposals on any or all sections of the work. The description of the extent of the work under each section is shown below.

Contract A-1 Comprising the lower section of Village Creek Collector, extending from sta. 39+30 on the survey line to sta. 184+04.5 just west of St. Marks Village, and consisting of:
- 5,355 ft. 10'-0" sewer
- 8,995 ft. 2'-0" sewer
- Village Creek siphon of 260 ft. of 5'-0" and of 7'-6" sewer
- 100 ft. 5'-0" siphon bypass
- Connection to Valley Creek Diversion line
- 2 transition sections
- 3 intercepting connections to present sewers including approximately 425 ft. of 18" sewer pipe and 15 ft. of 8" pipe
- All miscellaneous construction

Contract A-2 Comprising the middle section of Village Creek Collector, extending from sta. 184+04.5 to sta. 405+06 near the intersection of Tombigbee St. and 40th St. North, and consisting of:
- 6,930 ft. 5'-9" sewer
- 7,695 ft. 5'-3" sewer
- 7,485 ft. 5'-0" sewer
- 3,145 ft. 4'-9" sewer
- 200 ft. 5'-9" bypass sewer
- 4 transition sections
- 27 intercepting connections to present sewers including approximately 150 ft. of 18" sewer pipe, 335 ft. of 12" pipe, 50 ft. of 10" and 2,320 ft. of 8" pipe
- All miscellaneous construction

Contract A-3 Comprising the upper section of Village Creek Collector from sta. 405+06 to sta. 778+32, near Five Mile Creek just north of Meadowbrook Estates subdivision, and consisting of:
- 2,645 ft. 4'-4" sewer
- 1,020 ft. 4'-3" sewer
- 8,370 ft. 4'-0" sewer
- 1,485 ft. 3'-6" sewer
- 5,750 ft. 3'-0" sewer
- 4,000 ft. 2'-9" sewer
- 7,700 ft. 2'-6" sewer
- 2,700 ft. 2'-3" sewer
- 1,900 ft. 1'-6" sewer
- 1,020 ft. 12" sewer
- 7 transition sections
- 17 intercepting connections to present sewers including approximately 85 ft. of 18" sewer pipe, 420 ft. of 12" pipe, 715 ft. of 10" pipe and 1300 ft. of 8" pipe
- All miscellaneous construction

Contract A-4 Comprising the Valley Creek division line, extending south along the line of Border Street extended, from a connection with the Village Creek Collector just east of Roberts Field to a connection with the present Valley Creek Collector on the property of the A.C.L. R.R. one block east of Fayette St., and consisting of:
- 7,561 ft. 5'-6" sewer, mainly in tunnel
- All miscellaneous construction

CONTRACT B Furnishing precast reinforced concrete pipe or concrete pressure (centrifugal) pipe for Sections 1, 2 and 3 of Contract A.

The approximate quantities of pipe required for the three Sections of Contract A are as follows: 5,355 lin. ft. 10'-0"; 8,995 lin. ft. 8'-0"; 260 lin. ft. 7'-6"; 7,130 lin. ft. 5'-9"; 7,695 lin. ft. 5'-3"; 7,585 lin. ft. 5'-0"; 3,145 lin. ft. 4'-9"; 2,645 lin. ft. 4'-6"; 1,020 lin. ft. 4'-3"; 8,370 lin. ft. 4'-0"; 1,485 lin. ft. 3'-6"; 5,750 lin. ft. 3'-0"; 4,000 lin. ft. 2'-9"; 7,700 lin. ft. 2'-6"; 2,700 lin. ft. 2'-3".

Plans and Specifications are on file and may be examined at the office of Claude J. Rogers, County Engineer, Room 206, Jefferson County Court House, Birmingham 3, Alabama, J. W. Goodwin Engineering Co., Inc., "Management Engineers," 726 South 29th Street, Birmingham 5, Alabama, and at the office of Polglaze & Rasenberg, 812 South 27th Street, Birmingham 5, Alabama; and same may be obtained from the office of Polglaze & Rasenberg upon deposit of $35.00 per set. The full amount of deposit will be refunded to persons or firms submitting a bid, and all other deposits will be returned (less $20.00 which is actual cost of documents), upon return of all documents in good condition within five days after the date of opening of bids.

Only proposals submitted by bidders duly licensed as required by Act. No. 297, General Laws of Alabama, approved September 2, 1935, will be considered. The attention of all bidders is called to the provisions of State Law governing "General Contractors" as set forth in Chapter 1 of Title 46 of the 1940 Code of Alabama (Sections 65 to 82, both inclusive.)

All bids must be accompanied by cash, bid bond, or a check certified by a responsible bank, for amounts of not less than five per cent (5%) of the aggregate of the proposal; and such deposits shall be attached to the proposals. The payee of such check or the obligee of such bond shall be the Commission of Jefferson County. The maximum deposit by any one bidder need not exceed fifty thousand dollars ($50,000.00). The deposit shall be forfeited in case the Contractor fails to enter into Contract with good and sufficient bonds within 10 days after the Contract has been awarded to him.

The successful bidder will be required to furnish through an authorized agent in the State of Alabama a Performance Bond satisfactory to the Commission in the full amount of the Contract, and a labor and Materials Bond in a sum equal to but not less than one-half (½) of the Contract price.

No bid may be withdrawn after the time for opening bids has passed. The County reserves the right to hold the bids for a period of sixty days after the date of receiving the bids.

The County Commission reserves the right to reject any or all bids or waive any informalities in any bid, and to accept any bids considered advantageous to the Commission.

COMMISSION OF JEFFERSON COUNTY
By W. D. Kendrick
President
ATTEST: T. S. Lucius
Chief Clerk

POLGLAZE & BASENBERG, Engineers
812 South 27th Street
Birmingham 5, Alabama

Bids: April 3, 1951

Collecting Sewer System

Sealed bids will be received by the Commission of Jefferson County, Room 206 Courthouse, Birmingham 3, Alabama, at its office until 10:00 A.M., C.S.T., Tuesday, April 3, 1951, and at that time publicly opened and read, for furnishing the pipe and for constructing collecting sewer systems consisting of approximately 4.3 miles of sewers from 8" to 36" in diameter. The work is subdivided into the following contracts.

CONTRACT A—The work under this contract is for the furnishing of materials and construction of the Bessemer Sanitary Sewer Outfall, consisting principally of the following:
- 4941 feet 36" V.C. or Concrete Sewer
- 1798 feet 36" C.I. Sewer
- 300 feet Steel Truss & Piers
- 8 Manholes
- All miscellaneous construction

CONTRACT B—Furnishing only the items of Sewer pipe listed under contract A.

CONTRACT C—The work under this contract is for the furnishing of materials and construction of the Homewood Griffin Creek Sanitary Sewer Outfall, consisting principally of the following:
- 3318 feet 12" V.C. or Conc. Sewer
- 2925 feet 18" V.C. or Conc. Sewer
- 3714 feet 21" V.C. or Conc. Sewer
- 4497 feet 27" V.C. or Conc. Sewer
- 597 feet 30" V.C. or Conc. Sewer
- 600 feet 12" C.I. Sewer
- 832 feet 18" C. I. Sewer
- 414 feet 24" C.I. Sewer
- 70 Manholes
- All miscellaneous construction.

CONTRACT D—Furnishing only the items of Sewer pipe listed under contract D.

Plans, specifications and contract documents are open to public inspection at the office of C. J. Rogers, County Engineer, Room 206, Courthouse, and at the offices of J. W. Goodwin Engineering Co., Inc., 726 South 29th Street, Birmingham, Alabama, or may be obtained from J. W. Goodwin Engineering Co., Inc., upon deposit of $50.00. The full amount of deposit for one set of documents will be refunded (with deductions not exceeding the actual cost of the documents) upon return of all documents in good condition within three (3) days after the date of opening of bids.

A Performance Bond will be required of the successful bidder in the amount of 100% of the contract price. A Labor and Material Bond will be required of the successful bidder in the amount of 50% of the contract price.

Attention of Bidders is called to the License required by Act. No. 297 of General Laws of the Legislature of Alabama, approved September 2, 1935, entitled "An Act to Regulate the Licensing of General Contractors", and that it will be necessary for all persons submitting bids for work involving Ten Thousand Dollars or more to show satisfactory evidence of license as a general contractor. No Plans, specifications or proposal forms herein will be issued to other than licensed general contractors or their authorized agents.

Bids must be accompanied by a certified check or Bidder's Bond in an amount not less than five (5) percent of the base bid.

No bid may be withdrawn after the scheduled closing time for the receipt of bids for a period of sixty days.

The Owner reserves the right to reject any and all bids, and to waive informalities.

JEFFERSON COUNTY COMMISSION
By: W. D. Kendrick, President
Attest: T. S. Lucius, Chief Clerk

J. W. GOODWIN ENGINEERING CO., INC.
726 South 29th Street
Birmingham, Alabama

(Continued on page 91)

OFFICIAL PROPOSALS
(Continued from page 90)

Bids: March 21, 1951

State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, and special provisions for projects financed with federal aid funds, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time on Wednesday, March 21, 1951 by Henry A. Cohen, Director, Bureau of Contracts & Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects: Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts & Accounts, Albany, N. Y., and at the office of the District Engineers noted below, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for plans and proposal forms for each contract is indicated below. A refund will be made in full to bidders for the return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
		DISTRICT No. 3				
		Wm. Robinson, Dist. Engr., 301 E. Water Street, Syracuse, N. Y.				
Cortland	FASS51-1	Virgil-Messengerville, Pt. 3 Proj. No. S-520(4)	0.99	Bit. Mac. Opt. Rd. Mix 3 Sp. Alpha I-Beam 2 at 93' 10" & 1 at 94' 4" Alpha Royalty = $208.50	$21,000 Plans $10	$388,000
		DISTRICT No. 4				
		A. R. Mulligan, Dist. Engr., Barge Canal Terminal, Rochester, N. Y.				
Monroe	LOSP51-1P	Lake Ontario State (Pkwy.)	5.65	Asp. Conc. Ty. 1A, Opt.=	$42,000	$776,000
	LOSP51-2	Parkway, Sect. B (Serv. Rds.)	1.12	5.65 mi. Bot. Crse. Bit. Mac. Pen.= 1.12 mi.	Plans $25	
Monroe	FASS51-2	Archer Road (Co. Rd.) (Black Creek Br.) Proj. S357(1)	0.05	Misc. Work 2 Sp. I-Beam 51' 11½" Ea.	$7,000 Plans $10	$133,000
		DISTRICT No. 7				
		R. F. Hall, Dist. Engr., 444 VanDuzee Street, Watertown, N. Y.				
Lewis	FASS51-4	Indian River-Remington Corners, Co. Rd. Proj. S337(1)	10.68	Triple Surf. Treatment, Rob Gravel 40.12' I-Beam	$34,000 Plans $50	$585,000
		DISTRICT No. 8				
		J. S. Bixby, Dist. Engr., Pleasant Valley Road, Poughkeepsie, N. Y.				
Columbia	FASS51-5	Manorton-Lake Taghkanic Pt. 2, Co. Rd. 49 Proj. S234(3)	2.85	Bit. Treat. Grav. = 2.80 mi. Misc. Work = 0.05 mi. 26.6' Reinf. Conc. Slab 36' 6½" I-Beam	$12,000 Plans $15	$224,000
Orange	FASS51-7	Pine Island-N. J. State Line Co. Rd. 26 Proj. S307(1)	0.26	Asph. Conc. Ty. 1A, Opt. Alpha Deck Plate Girder 110' Alpha Royalty = $125.20	$10,000 Plans $10	$175,000
Orange	FASS51-3	Scotchtown-Collabar, Co. Rd. 47 Proj. S308(1)	4.53	Bit. Mac. Pen. Method, Type 1	$13,000 Plans $15	$238,000
Ulster	FASS51-8	New Paltz-Minnewaska, Co. Rd. 117 Proj. S313(1)	4.56	Asph. Conc. Ty. 1A, Opt.	$18,000 Plans $15	$319,000
		DISTRICT No. 9				
		F. W. Donovan, Dist. Engr., 71 Frederick Street, Binghamton, N. Y.				
Chenango	FASSH51-1 FASSH51-2P	Bainbridge-Masonville, Pt. 1A Bainbridge-Masonville, Pt. 1 FAS SH50-15 Proj. S273(2)	0.57	Asph. Conc. Ty. 1A, Opt. Cantilever Deck Girder (Alpha) 3 Spans, 2 at 155' & 1 at 190' Alpha Royalty = $495.30	$40,000 Plans $15	$693,000
		DISTRICT No. 10				
		J. J. Darcy, Dist. Engr., Montauk Hwy. at Little E. Neck Road, Babylon, L. I., N. Y.				
Bronx	FACBE51-1	Cross Bronx Expressway, Contract 1B Proj. U1084(11)	1.23	Demolition of Bldgs.	$9,500 Plans $10	$173,000
Suffolk	RC51-3	Amityville Village: Broadway S. H. 1633 Amityville Village, S. H. 5300	0.68	Asph. Conc. Ty. 1A, Opt.= 0.47 mi. Misc. Work = 0.21 mi.	$7,000 Plans $10	$128,000

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of "State of New York, Commissioner of Taxation & Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders". When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated. The right is reserved to reject any or all bids.

B. D. TALLAMY
Supt. of Public Works

U. S. Government

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-3321) will be received by Bureau of Reclamation, Ft. Collins, Colorado, until March 28, 1951, and then publicly opened for furnishing labor and materials and performing all work for the construction of North Poudre Supply Canal Diversion Dam and North Poudre Supply Canal from Station 6+60 to Station 678+55, Colorado-Big Thompson Project, Colorado. The Work is situated approximately 15 miles northwest of Ft. Collins, Colorado. Principal items in 6 schedules are approximately: 492,600 cu. yds. excavation for canal and 4 tunnels, tunnel lengths total 2.9 mi.; 18,400 cu. yds. concrete, including tunnel and canal linings; 894 lin. ft. of 84-in. Monolithic- or precast-concrete pipe siphon; 380,500 lbs. of metalwork, including radial gates and tunnel supports; and other work. Time allowed for completion will be 730 days. For particulars, address Bureau of Reclamation, Ft. Collins, Colorado; or Building 1-A, Denver Federal Center, Denver, Colorado.

U. S. Government

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-3322) will be received by Bureau of Reclamation, Fort Peck, Montana, until March 27, 1951, and then publicly opened for furnishing labor and materials and performing all work for the construction of Fort Peck-Glasgow Bench 69-kilovolt transmission line, Fort Peck Project, Montana. The work is situated near the Fort Peck Dam in the northeast portion of Montana. The transmission line, will be 3-phase, single-circuit, wood-pole, H-frame type, approximately 16 miles long, and will have overhead ground wires only for ¼ mile at each end. Completion of work is desired in 240 days. For particulars, address Bureau of Reclamation, Fort Peck, Montana; or Building 1-A, Denver Federal Center, Denver, Colorado.

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. DS-3328) will be received by the Bureau of Reclamation, Denver, Colorado, until March 27, 1951, and then publicly opened for furnishing precast-reinforced-concrete pipe for Southern San Joaquin Municipal Utility District, Unit 3, Friant-Kern Canal Distribution System, Central Valley Project, California. Delivery is desired within 330 days. For particulars, adress Bureau of Reclamation, Building 1-A, Denver Federal Center, Denver, Colorado.

UNITED STATES DEPARTMENT OF THE INTERIOR, BUREAU OF RECLAMATION. NOTICE IS HEREBY GIVEN that sealed bids n Specifications No. 703S-174 will be received at P. O. Box 280, Reclamation Center, Casper, Wyoming, until 10 a.m., Mountain Standard Time, March 15, 1951, and then publicly opened for furnishing and delivering Prefabricated Building for Control House at Sinclair substation, Transmission Division, Wyoming, Missouri River Basin Project.

Copies on the standard forms and of the specifications may be obtained from the following offices of the Bureau of Reclamation: Avery A. Batson, Regional Director, New Customhouse, Denver, Colorado, and I. J. Matthews, District Manager, P. O. Box 280, Casper, Wyoming. No charge to prospective bidders for copies of the specifications; to others $0.25 per copy, not returnable.

Office of the District Engineer, Corps of Engineers, U. S. Army, 1217 U. S. Post Office and Custom House, St. Paul 1, Minnesota.—Sealed bids, in duplicate, for furnishing all labor and materials and performing all work required for construction of Orwell Dam on Otter Tail River, Minnesota, will be received in this office until 2:00 P.M., C.S.T., 27 March 1951, and then publicly opened. Further information upon application.

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-3330) will be received by Bureau of Reclamation, Moorcroft, Wyoming, until March 29, 1951, and then publicly opened for furnishing labor and materials and performing all work for the relocation of State Highway (U. S. No. 14) Keyhole Dam Reservoir, Cheyenne Division, Keyhole Unit, Wyoming, Missouri River Basin Project. The work is situated approximately 6 miles northeast of Moorcroft, Wyoming. Principal items are approximately: 180,000 cu. yds., excavation; furnish and lay 1,300 lin. ft., corrugated-metal pipe; 6,300 tons, bituminous surfacing; and other work. Time allowed for completion will be 360 days. For particulars, address Bureau of Reclamation, Moorcroft, Wyoming; or Building 1-A, Denver Federal Center, Denver, Colorado.

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REPLIES (Box No.): Address to office nearest you
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CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

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WANTED, ENGINEER, Structural or Mechanical to advise in preparation of plans, review drawings, supervise and inspect construction, etc. State experience, age and salary required. Address the Commissioner, Tennessee Department of Public Health, 420-6th Avenue North, Nashville, Tennessee.

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ENGINEERS WANTED for industrial fire prevention field work by national insurance organization with offices in most major cities. These are permanent jobs with a real future, but candidates should appreciate that extensive away-from-home travel is involved. Age 26-40 preferred. P-8306, Engineering News-Record.

WANTED: STRUCTURAL Engineers, Mechanical Engineers and Industrial Architects; some defense work. Seelye, Stevenson & Value, 101 Park Avenue, New York, N. Y.

(Continued on page 93)

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P-8870, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

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P-8981, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

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P-9011, Engineering News-Record
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SW-8869, Engineering News-Record
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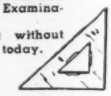

WILSON ENGINEERING CORP.
College House Offices - Dept. E.
Harvard Sq. Cambridge, Mass.

POSITIONS VACANT
(Continued from page 91)

SUPERINTENDENT—MUST have experience on sewer construction preferably on deep sewers in soft ground requiring bracing. Write giving age, experience, education and salary expected. P-8951, Engineering News-Record.

SUPERINTENDENT—ONE who has had experience on bridge construction. Work would be in Pennsylvania, New Jersey, Delaware, or Maryland. Advise full details including salary, age, education and experience. P-8952, Engineering News-Record.

STRUCTURAL STEEL Detail Draftsmen and Checkers. All types of Structures. Vacation and bonus plan, group insurance, good working conditions. Only top quality men. Send complete written information. Samborn, Steketee and Associates, 1214 Cherry Street, Toledo 2, Ohio.

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BRIDGE DESIGNERS and Structural Draftsmen. Openings for both experienced men and recent graduates. Applicants should furnish complete information. Frank D. McEnteer, Consulting Engineer, Clarksburg, W. Va.

GENERAL SUPERINTENDENT for work in Eastern part of the Country, must be capable of supervising all phases of Highway construction. Reply stating age, experience and references. P-9052, Engineering News-Record.

WANTED: STRUCTURAL Engineers for pulp and paper mill design including mill layout and structural steel and reinforced concrete design. In first letter give complete engineering experience, age, education, etc. Address Construction Engineer, P. O. Box 1844, Savannah, Ga.

DRAFTSMEN: EXPERIENCED in detailing and checking structural steel, steel stairs, miscellaneous and ornamental iron. Must be interested in permanent employment. Good working conditions with group hospitalization, health and accident insurance available. Give education, experience, age, salary desired and date available. The J. T. Edwards Co., 1241 McKinley Avenue, Columbus 8, Ohio.

ENGINEER, SEWER and waterline construction. Western New York State. Reply full details of past experience, salary requirements, availability. P-9078, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT. Immediate opening for General Superintendent for heavy concrete construction, including Bridges, Roads, Dams etc for work in Maryland. Must have excellent record for character, experience and production. Please submit full information including past experience and when available. Salary secondary to procuring right man. Our employees know of this advertisement. P-9079, Engineering News-Record.

WANTED A Contractor's Engineer, experienced on the job in hospitals, schools, commercial construction. Steady employment with well-established contractor located in Central New York in city of 35,000 serving a 300,000 population. Married man, 35-50 years old preferred. Character and personality as well as ability desired. Write P-9072, Engineering News-Record.

PROJECT ENGINEER and Structure Engineer wanted by reliable contracting firm on canal work in California and Arizona. Prefer engineering graduate with two or more years on construction. P-9107, Engineering News-Record.

POSITIONS VACANT

WANTED: ASSISTANT Crushed Rock Superintendent. Only experienced personnel need apply. Salary open. L. G. Everist, Inc., Sioux Falls, South Dakota.

BRIDGE SUPERINTENDENT. Opening for man who can handle construction of half million dollar job in Maryland. In replying give full details covering age, education and experience and salaries earned. Will not contact present employer until after first interview. Splendid opportunity for a real producer. P-9080, Engineering News-Record.

ENGINEER, EXPERIENCED in quantity survey and estimating for all types heavy construction such as bridges, viaducts, foundations, etc. Permanent position in New York area if qualified, with salary commensurate with ability. Submit complete experience resume with reply. P-9127, Engineering News-Record.

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POSITIONS WANTED

ENGINEER: GRADUATE C.E., registered, 20 years experience in plant and heavy construction. Also general engineering work. Desires permanent position commensurate with experience and qualifications. PW-8397, Engineering News-Record.

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SUPERINTENDENT CONSTRUCTION 22 years experience grading and concrete paving, some asphalt. Go anywhere. PW-9120, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT and Field Engineer. Excellent layout man. General construction exp., foundations, excavations, municipal work, roads. Will work anywhere in U. S. Age 44. 22 yrs. exp. Available immediately. PW-9122, Engineering News-Record.

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PW-9021, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

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CIVIL ENGINEER, College graduate, age 44, P.E. license in six states, 22 years on construction of highways, bridges, sewers, buildings, utility valuation, last 14 years on steam power plants as Project Engineer. Presently employed, but desires permanent location. Location immaterial. PW-9102, Engineering News-Record.

ELECTRICAL ENGINEER — Industrial and utility construction estimator, superintendent and designer. Age 33; married; registered. Write PW-9114, Engineering News-Record.

PLANT ENGINEER—Structural and mechanical, 17 years experience design, construction, machinery installation, purchasing, plant records and appraisal. Degrees. P.E. Ability to organize and supervise work, make contracts, handle correspondence. PW-9115, Engineering News-Record.

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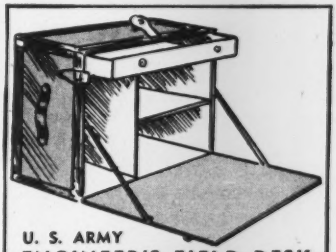

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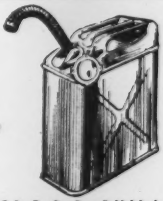

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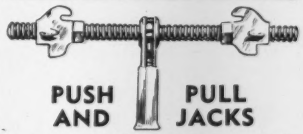

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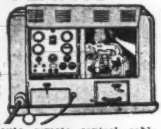

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Portable electric hammer

Simplified design results in a unit with only one working part. The Model 4357 portable electric hammer incorporates a specially designed power unit consisting of two alternately energized magnetic coils, eliminating gears, cranks, and connecting rods. This 1¼-in. hammer has an efficient operating range of ⅜ to 1¼-in.-dia star drills and extreme operating limits of ⅜ to 1½-in.-dia star drills. It is 16¼ in. long, weighs 20 lb, and strikes 3,600 blows per min.—SKILSAW, INC., 5033 ELSTON AVE., CHICAGO 30, ILL.

Ink for copy machines

Actinic fountain pen inks for Ozalid, Bruning, and other copy machines are available in three colors.—brown, green, and black. They are said to be more opaque under exposure to actinic lights and to produce strong, sharp copies. These inks are eradicable, and can be used in any fountain pen.—SANFORD INK CO., BELLWOOD, ILL.

Prefabricated wood trusses

Douglas-fir trusses are factory finished and delivered ready for assembly. No special tools are required for their erection. They have a high strength-to-weight ratio and provide a sturdy, uniform roof support in post-free buildings. Roof sheeting can be nailed directly to the trusses. Available in sizes to 50-ft clear span.—FARM BUILDING SERVICE, ROCHELLE, ILL.

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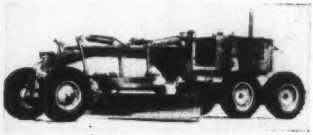
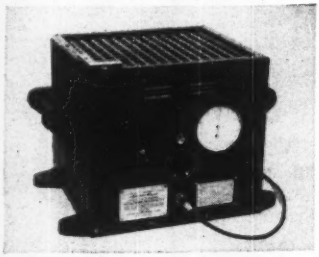
Monsoon formulation is described as an invisible water repellent for brick, mortar, and other types of masonry structures. Application can be over a wide temperature range. Monsoon features a silicone resin base. The product is applied by brush or spray.—STATE CHEMICAL CORP., 1265 BROADWAY, NEW YORK 1, N. Y.



Heavy-duty motor grader

Model 104 grader features a constant-mesh transmission providing six overlapping forward speeds (1.1 to 20.1 mph). High reverse speed is 8.4 mph. All shifting (forward or reverse) is accomplished by a single lever. Hydraulic shiftable moldboard (optional) provides a maximum extension of the blade 97 in. beyond rear tires with a 12-ft moldboard. Weight is from 21,840 lb up, depending on extra equipment.—THE GALION IRON WORKS & MFG. CO., GALION, OHIO.



Magnetorque dynamometer

Compact, portable dynamometer measures torque developed by prime movers rated from ¼ to 10 hp. It features the use of a magnetic-particle coupling. The device may be used at any speed from 0 to 6,000 rpm and is calibrated in the range from 1,500 to 6,000. Accuracy is 5% of full load. The instrument is mounted in an 11x11x12-in. cabinet, and weighs 130 lb.—AVION INSTRUMENT CORP., 121 E. 24TH ST., NEW YORK 10, N. Y.

Dry-Fan cooling tower

Blower-type Dry-Fan cooling tower is available in two models. The 2-B Series is a single-fan model available in 9 sizes, with capacities ranging from 3 to 30 tons of refrigeration. The 2-BB Series is equipped with two

(*Continued on page 103*)

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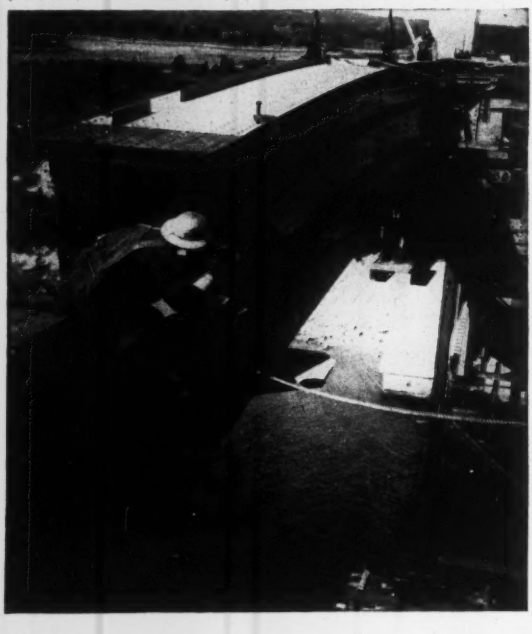
Showing the new Annisquam River Bridge at Gloucester, Mass. The box-girder arch structure carries Northern Circumferential Highway over the Annisquam River, and connects Cape Ann with mainland. Designer: Department of Public Works, Commonwealth of Massachusetts.

New Link in Massachusetts Highway System

Erection of arch nears completion as the first of the closing arch ribs is eased into position between the ends of adjacent sections which are erected on falsework.



Bridge work as steelworkers see it. This closeup shows placing of riveted arch rib.

This attractive steel arch, recently completed north of Gloucester, Mass., is known as the Annisquam River Bridge. It is part of the popular Northern Circumferential Highway, and offers something new to motorists in the Gloucester area — a high-level river crossing between picturesque Cape Ann and the mainland.

The Annisquam River Bridge is of the box-girder arch type. Its main arch span is 426-ft in length. At each end it has a 209-ft girder continuous over three spans. Its piers are faced on three sides with Chelmsford granite. The structure carries two 26-ft lanes, separated by a 4-ft center mall, and has two 5-ft walks for pedestrians.

Bethlehem handled both the fabrication and erection of the 2512-ton superstructure of this important new link in the growing system of Massachusetts highways.

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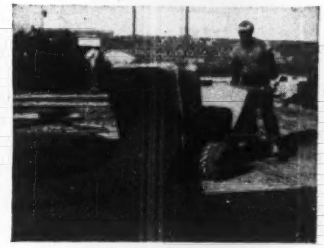

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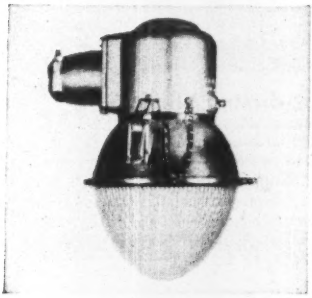

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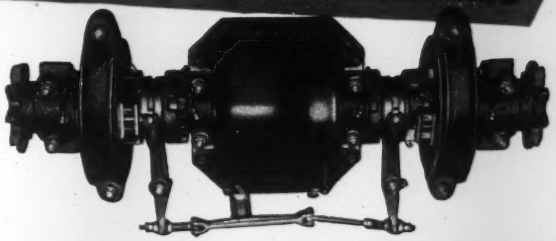

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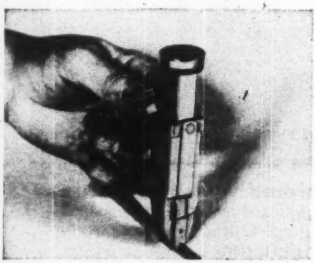

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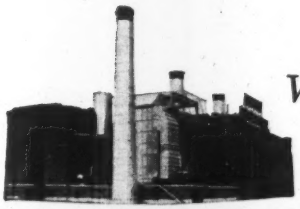
Small Taco pump will handle 10 gpm against a 3-ft head. It is recommended as a water circulator, coolant pump, and for other applications where it is desired to move water or soluble oils not under pressure. Featuring light weight and low-cost operation, it is powered by a 1/25-hp motor, and requires no lubrication.—TACO HEATERS, INC., 137 SOUTH ST., PROVIDENCE 3, R. I.

Water-level safety switch

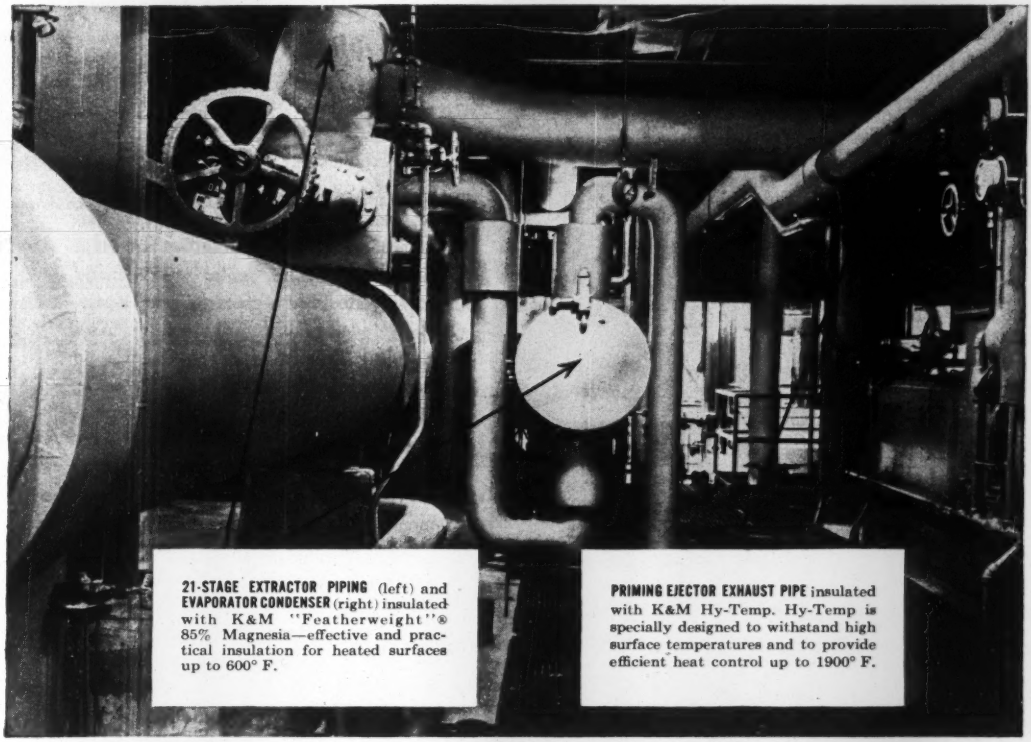
Autocon Hi-Level safety switch operates an audible or visual alarm when the liquid level in tanks, rivers, or

(*Continued on page 107*)



Where the best in insulation is a must

Public Service Co. of Oklahoma uses K&M Insulations in Weleetka Power Station



21-STAGE EXTRACTOR PIPING (left) and **EVAPORATOR CONDENSER** (right) insulated with K&M "Featherweight"® 85% Magnesia—effective and practical insulation for heated surfaces up to 600° F.

PRIMING EJECTOR EXHAUST PIPE insulated with K&M Hy-Temp. Hy-Temp is specially designed to withstand high surface temperatures and to provide efficient heat control up to 1900° F.

Insulation Contractor: Armstrong Cork Company

These K&M insulations keep steam hotter—longer—at less cost!

In power stations, oil refineries, chemical plants, factories, steamships, hospitals—in fact, wherever exacting steam control is a must—you'll find K&M "Featherweight" 85% Magnesia and K&M Hy-Temp Insulations. These two K&M products give you highly efficient, cost-cutting insulation in every service temperature range. And, for especially difficult heat control situations, the advantages of both are combined in K&M Hy-Temp Combination Insulation.

Your Keasbey & Mattison Distributor—who is an experienced applicator—will be glad to give you complete information on these or any K&M Insulations. Or, write us.

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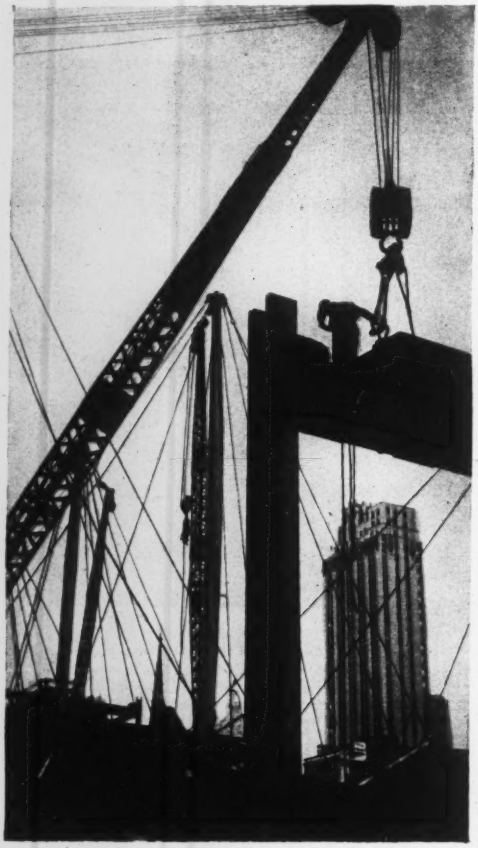
WIRE ROPE



Roebling rope is a big help in the drive for lower costs

FOR EASY HANDLING, extra toughness and service life, there's nothing like Roebling Preformed "Blue Center" Steel Wire Rope. "Blue Center" steel—made only by Roebling—gives rope top resistance to abrasion and fatigue. And Roebling Preforming gives you a rope that spools better... doesn't tend to set or kink... minimizes vibration and whipping.

There is a Roebling wire rope of the right construction, grade and size for every type and make of rope-rigged equipment. Have your Roebling Field man help choose the rope that will give you the best and the lowest-cost performance. Still further savings may be effected by following his suggestions about the proper installation, use and maintenance of wire rope. John A. Roebling's Sons Company, Trenton 2, New Jersey.

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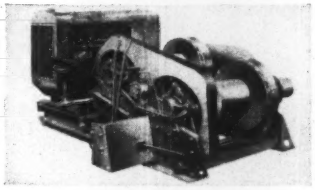
sumps approaches an unusual load condition is in danger of overflow; or when other emergencies arise. A ¼-in. rise in water lever compresses air in the bell chamber, causing the switch to set off an alarm.—Automatic Control Co., St. Paul 4, Minn.



Pull hoist

Frame-5 8,000-lb line pull hoist features: Smooth operation, safe and positive load control, economy in power consumption, low maintenance, and accessibility of all wearing parts. Equalized linkage of the band clutches provides smooth and even friction engagement and release. Large diameter brakes permit accurate load control. Shafts rotate on ball bearings. Can be used with gasoline, diesel, or electric power. Line speeds range to 279 fpm.—Clyde Iron Works, Inc., Duluth 1, Minn.

Water-repellent coating

Flexseal waterproofing compound is designed for use on masonry and various insulating materials. Depending on nature of the surface, and amount used, Flexseal will penetrate from ⅛ to ¼ in. It is colorless; can be applied by spray, brush, or poured on; and will cover 200 to 300 sq ft/gal.—Flexrock Co., Filbert & Cuthbert, Philadelphia 4, Pa.

New Product Briefs

Soil-testing unit consists of a tamper, mold, collar remover, and sample ejector. Made by: Soil Testing Services, Inc., Chicago 22, Ill.

Glasses-cleaning tissues are interfolded for handling in a simple dispenser. Magic Lens tissues are silicone treated. Produced by: The Silicone Paper Co. of America, Inc., New York 17, N. Y.

Wood folding rules with engineers' markings are available in two styles—with double or single-edge graduations. Made by: Eagle Rule Mfg. Corp., New York 59, N. Y.

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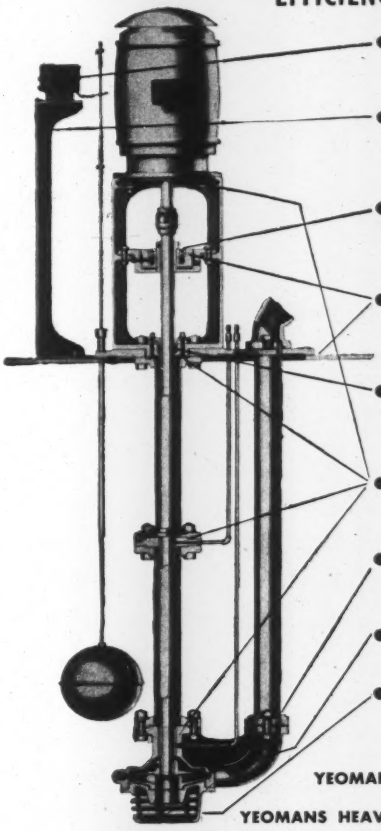
HAVE *all* THESE FEATURES ESSENTIAL TO HIGHEST EFFICIENCY AND LONGEST LIFE



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  —makes for easy adjustment of impeller clearance and for easy assembly and adjustment after repairs
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  —prevents submergence of bearing; eliminates possibility of moisture entering bearing through suspension pipe
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  —prevents escape of gases, moisture or vapors from suspension pipe; most effective type of construction.
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  —essential to proper alignment of rotating parts
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  —prevents strain in pump assembly, much more efficient than rigid joints
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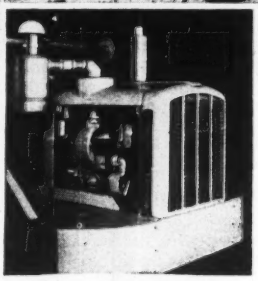
Capable of digging speeds up to 156 inches per minute, Parsons 250 Trenchliner owned by Vanderver and Christian, Tyler, Texas, is powered with a 3-cylinder GM Series 71 Diesel engine delivering 89 H.P. at 1800 RPM. Mr. W. N. Christian says, "We are well pleased with this machine and the GM Diesel engine is giving excellent performance."



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TO DIG A DITCH

THIS General Motors Diesel-powered Parsons 250 Trenchliner, powered by a General Motors Diesel, took on the toughest kind of a pipe-trench job—8 miles of 42" trench, depth to 17 feet—through soil ranging from hard red clay to sand. Line of travel was from Lake Tyler to Tyler, Texas, through rough, hilly country, across numerous creeks with "soft" approaches.

Jobs like this are a "natural" for GM Diesels because of their more efficient 2-cycle operation. With power at every piston downstroke, these engines start at the press of a button—give instant response to widely fluctuating power demands—and cut fuel costs to the core.

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GENERAL MOTORS

GM GENERAL MOTORS DIESEL POWER

DIESEL BRAWN WITHOUT THE BULK

MANUFACTURERS' PUBLICATIONS

Wood preservative—Descriptive booklet (12 pp) traces history and development of Chemonite copper-arsenic preservative, lists facts and figures to show its efficiency, and indicates the correct uses of Chemonite-treated wood.—J. H. Baxter & Co., 200 Bush St., San Francisco 4, Calif.

Rear-dump Euclids – Models 80FD and 82FD rear-dump Euclids of 15-ton capacity are described in this 8-pager. The bulletin describes various features of these off-highway hauling units and lists principal specifications, including power units, speeds, and others.—The Euclid Road Machinery Co., Chardon Road, Cleveland 17, Ohio.

Acoustical-tile clips—Short form specifications and comparative cost data for a fast sag-proof method of installing acoustical tile and board with Nelson Quick-Clips are included in a 4-p bulletin describing this technique.—Nelson Stud Welding Division, Morton Gregory Corp., Lorain, Ohio.

Water meters—Auto-Stop meters for automatically controlling amount of water delivered to ready-mix concrete batches are described in Bulletin 562. These meters are operated by buttons set to the number of gallons required. The bulletin contains complete specifications and prices for 1, 1½, and 2-in. meters for cold, warm, or hot water.—Neptune Meter Co., 50 W. 50th St., New York 20, N. Y.

Crane-excavators—Fourteen-page catalog describes the heavy-duty line of Wayne ¼-yd crane-excavators. Features of all three models (crawler, truck, and wagon) are shown. These include deck-machinery layout, self-leveling chassis, oversize 20-in. clutches, large modern cab, and right-angle drive mechanism. Lifting capacities range from 8 to 12½ tons. Each model is convertible to all front-end attachments. Gasoline or diesel power is optional. Complete specifications and operating data are included.—Wayne Crane Div., American Steel Dredge Co., Inc., Fort Wayne, Ind.

Water-level gauges—Bulletin L700 describes instruments for measuring and recording water depth in reservoirs, elevated tanks, rivers, lakes, irrigation systems, flumes, weirs, etc. Several

(Continued on next page)

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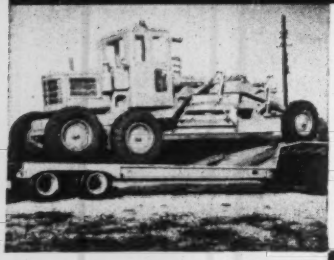
What's *Your* hauling problem?

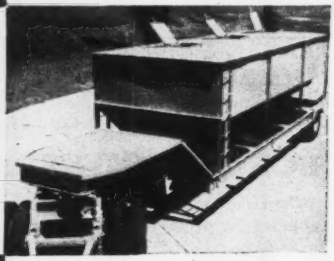


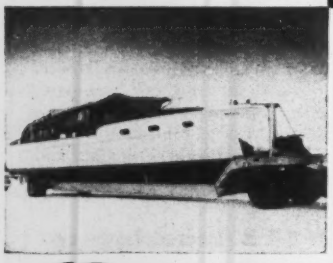
Motor Graders!

To speed hauling of motor graders within 50 to 100-mile radius, La Crosse developed this 19-ton tandem axle trailer, with special ramp for loading grader steering wheels on trailer gooseneck. Trailer idea cuts grader travel time 50% . . . saves wear on graders.

Bulk Materials!

This special La Crosse-engineered "bin trailer" eliminated high labor cost for bagging and unbagging corn starch . . . cut delivery time 90% from processing mill to finishing plant 2 miles away. Tapered La Crosse bin is equipped with worm gear unloader at bottom.





Boats, etc.!

Featuring low height and special "hull-tailored" saddles, this custom-built La Crosse trailer cut the cost of hauling a 13-ton Chris Craft over 50% per trip. It also simplifies loading and unloading . . . insures a safer ride without damage to structure or finish of boat.

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Occupation or business.....

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City.....State.....

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America's Favorite **LOW BED TRAILER**

types of gages are listed, as are devices for measurement and automatic control of water and other liquids and solutions whether flowing, turbulent, under static pressure, or carrying solid matter. The bulletin also contains information on remote recording and remote automatic pump control of water level with Metameter telemetering instruments.—The Bristol Co., Waterbury, Conn.

Open-steel flooring—Catalog describes various types of open steel flooring and armoring. Catalog 1103 discusses different types of Tri-Lok products listing specification data, safe-load tables, installation methods, and other pertinent information. Also included is a description of T-Tri-Lok flooring—an assembly of Tee bars which can be filled with concrete to produce a heavy concrete flooring with reduced dead load.—Dravo Corp., Machinery Div., National Dept., 5th & Liberty Aves., Pittsburgh 22, Pa.

Welding-alloy chart—Revised chart can be filed, bound, or unfolded to an 11x 23-in. chart for wall mounting. It contains information on a complete line of welding alloys covering means of application and recommended uses. Included is a full-page listing of suggestions for repairs and maintenance of equipment and machines.—Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.

Wood preservative—"Pointers on Penta" provides technical information on the use of penta pressure-treated wood. The booklet contains information to guide users on types of treatment to meet particular requirements.—The Dow Chemical Co., Midland, Mich.

Sling chains—Safety rules and data on chain inspection, use, and care are listed in Bulletin SC-48. Recommended load limits are listed in detail for various chain sizes and suspension angles. Single and double sling-chain specifications are presented in tabular form.—Cleveland Chain & Mfg. Co., Broadway Ave. & Henry, Cleveland 5, Ohio.

Portable tools—Complete specifications for a line of portable tools are presented in this 4-p condensed catalog. Tools listed include drills, saws, and disk sanders. Accessories include saw blades, abrasive wheels, grinding wheels, wire brushes, backing pads, and a rotary planer head mountable on the sander spindle.—Cummins Portable Tools, Div. of Cummins-Chicago Corp., 4740 N. Ravenswood Ave., Chicago 40, Ill.

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Water vs. Scenery

An interesting question as to whose rights or needs should predominate is brought to light by the resignation of Newton B. Drury, director of the National Park Service for the past decade. Mr. Drury is understood to have been asked to resign because of disagreement with Oscar L. Chapman, Secretary of Interior, over a proposal to build a dam in an area known as the Dinosaur National Monument. The structure in question is Echo Park Dam, one of three on headwaters of the Colorado River recommended for early construction by the Bureau of Reclamation (ENR Feb. 15, p. 24).

This dam will be on the Green River in Colorado, close to the Colorado-Utah border, and is designed to store water in the canyons of the Green and Yampa rivers and to produce power.

• **Water badly needed**—Under the Colorado River Compact, the Upper Basin states are required to deliver a specified amount of water each year to the Lower Basin states. Without hold-over storage from wet years they would not be able to do this in dry years and still have water enough for their own needs. Hence the engineers of the Upper Basin states have surveyed possible sites for storage reservoirs and have selected the most economical sites for several reservoirs, of which the Echo Park site is one.

According to F. C. Merriell, chief engineer of the Colorado River Water Conservation District, no other site having so low an evaporation loss can be found to store the water proposed to be stored in the Echo Park reservoir. Use of that site makes possible a saving of 350,000 acre-feet annually.

• **Few can reach the area**—Concerning the assertion of the Park Service that Echo Park reservoir will "ruin the Dinosaur National Monument," Mr. Merriell states that the original Dinosaur National Monument was only 80 acres in area, which lies entirely outside of and will not be disturbed by the reservoir. The canyon area where the water will be stored is so remote and inaccessible that only the most hardy river men have ever run boats through it. Local people, he adds, with great difficulty, persuaded the Park Service in 1938, 23 years after the original monument was created, to enlarge the monument area. At that time the Park Service, as the record shows, promised not to impede local plans to develop reservoir sites that would lie within the enlarged reservation. Nevertheless, as soon as plans for Echo Park Dam began to take form a campaign to prevent its construction was started.

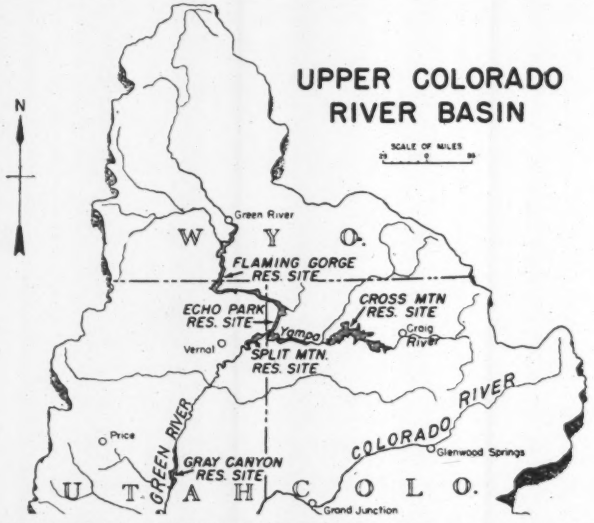
• **Panther Mountain reservoir**—A somewhat similar situation developed last year in connection with plans of the Black River Regulating District in New York to build Panther Mountain Dam to form a reservoir to store flood waters on a tributary of the Black River, which rises in the Adirondack Park. The reservoir to be formed by this dam would flood 934 acres of the vast Adirondack Forest Preserve and 3,190 acres belonging to the Adirondack League Club, an exclusive recreational group owning a large area of forest land adjoining the publicly owned forest preserve.

River regulating districts in New York are state agencies. They were set up to conserve flood flows for use at time of low flow. Costs of the structures they build are assessed against the communities benefitting from flood protection and power companies and industries that use the water. An amendment to the state's constitution authorized the districts to use a small percent of the lands in the forest preserve for reservoirs.

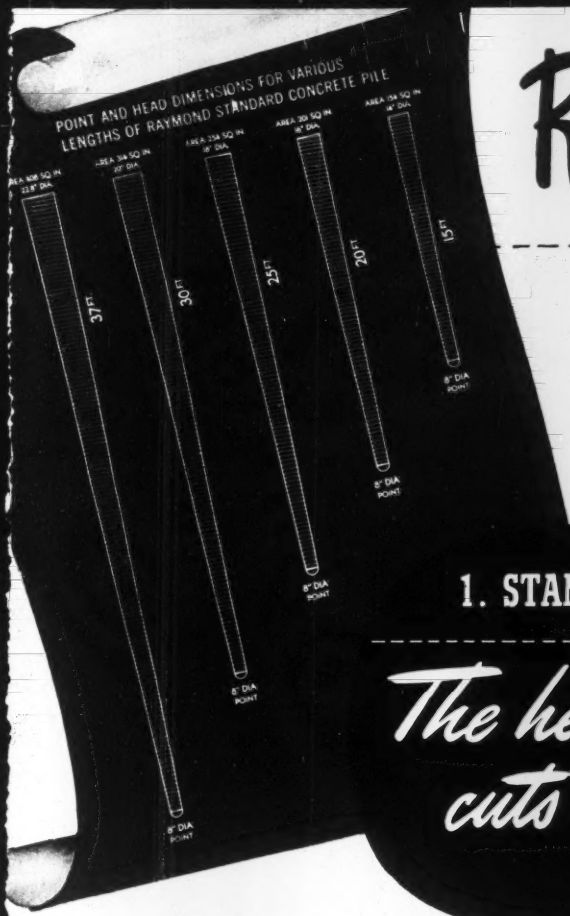
The district held hearings on its plans for Panther Mountain Reservoir in 1948 and issued the order to its engineers to proceed with the work late that year only to have the order blocked temporarily by court action inaugurated by the Adirondack League Club.

• **What the "wildlifers" said**—Then early last year, when the district undertook to start construction, it found itself the object of a well organized attack by fish and game clubs, by communications to local papers and by pleas to members of the state legislature.

Actually, all the state land that was to be taken amounted to less than 1,000 acres of the 2,178,000 in the forest preserve. Nevertheless this attack was successful. It resulted in the passage of a special act forbidding construction of river regulatory reservoirs on the south branch of the Moose River in Herkimer and Hamilton Counties. As the Panther Mountain Reservoir was to have been in that area the act, written in general terms, effectively stopped its construction.



RESERVOIR PLANS START CONTROVERSY—A proposal to construct the Echo Park reservoir in canyons forming part of the Dinosaur National Monument is being opposed by the National Park Service.



Raymond MAKES 5 TYPES OF CONCRETE PILES

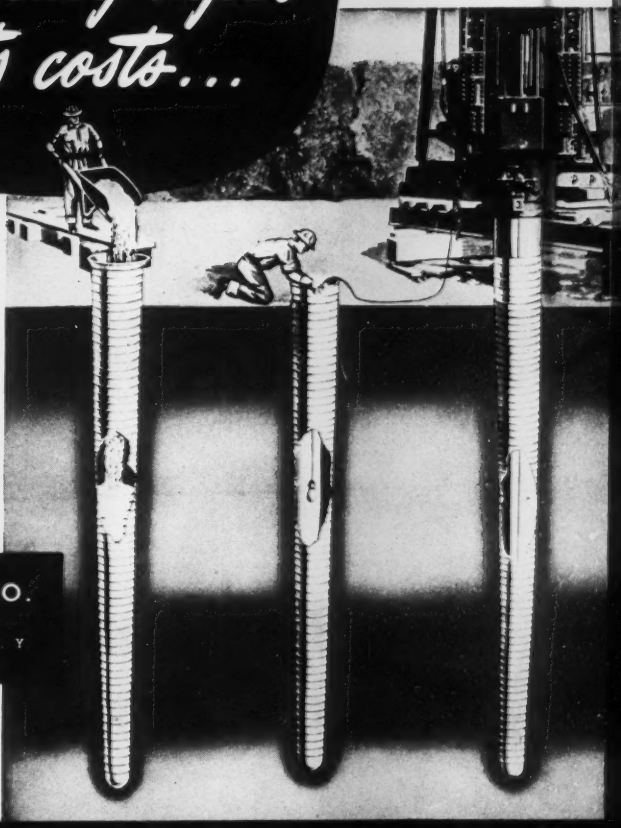
1. STANDARD
2. STEP-TAPER
3. PIPE STEP-TAPER
4. COMPOSITE
5. GOW CAISSONS

Raymond installs every type of pile: cast-in-place concrete, precast concrete, steel pipe, wood and H-beam. Raymond operations include underpinning; borings and soil investigations; waterfront construction and harbor and river improvements; and cement mortar lining of oil and water pipe lines 4" to 144" in diameter by the Centriline Corporation, a Raymond subsidiary.

1. STANDARD PILES

The heavy taper cuts costs...

Note that the permanent steel shell maintains the soil pressure developed during driving and while the concrete is setting, thus insuring a perfect pile free from distortion with a high load capacity.



Raymond Standard Concrete Piles have a heavy, uniformly tapered permanent steel shell. On friction piles, this taper acts like a wedge, giving these specific advantages:

1. Driving resistance is maintained.
2. The load is transmitted to the soil through the entire length of the pile.
3. The load can be carried by shorter piles, because of their greater carrying capacity.
4. Since shorter piles cost less to drive, the taper usually results in substantial savings.

Each of these statements has been tested and proved innumerable times. The evidence is at your disposal at any of our offices. Your inquiry is cordially invited.

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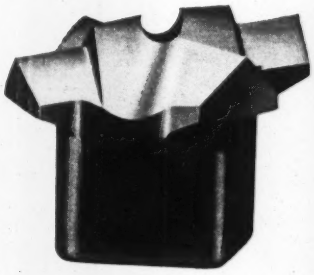

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